Margin Call on Morality: An Analysis of the Role of Morals in the 2007-2008 Financial Crisis

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Abstract

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Title: Margin Call on Morality: An Analysis of the Role of Morals in the 2007-2008 Financial Crisis

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The causes of the 2007-2008 US financial crisis that nearly brought down the largest economy in world history are both complex and numerous. While the eventual bursting of the housing bubble that precipitated the collapse is the ultimate force that pushed the economy over the edge, the root causes extend all the way back to the Great Depression and the resulting government legislation passed in its wake. This legislation combined with future government intervention into the housing market and the rise of securitization from the private sector primed the economy for an apocalyptically catastrophic collapse, forcing millions of Americans out of homes, out of jobs, and into bankruptcy. While many suffers claim that the greed-fueled investment banks on Wall Street and their political counterparts in Washington are the ones to blame, the scale and scope of the crash are far too expansive to allow for any single individual, firm, or decision to be the sole source of blame. Ultimately, in order to answer the question of whether a lack of morals was what truly dismantled history's largest ever economy requires revisiting nearly a century's worth of build up. The following sections will attempt to do just that.

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Introduction

Towards the climax of J.C. Chandor's film *Margin Call,* which examines the hours leading up to the start of the 2008 United States Housing Market Crash, Seth Bregman, a young analyst at an unnamed Wall Street investment bank loosely based on Lehman Brothers, arrives at the notion that his firm's choosing to liquidate the entirety of their portfolio's toxic assets in an attempt to avoid bankruptcy is "going to affect people...real people" (Chandor, 2011). Bregman, who has arrived at this juncture as an inexperienced, naïve analyst, makes the observation after learning that he will likely lose his job during a discussion with his floor head and immediate superior, Will Emerson. The short, yet cogent reaction to understanding that the bank's selfish response will ripple beyond just Wall Street contrasts vividly with Emerson's lengthy, cynical perspective of the situation: "Listen, if you really want to do [investment banking] with your life, you have to believe you're necessary—and you are. If people want to live like this in their cars and big fuckin' houses they can't even pay for, then you're necessary. The only reason that they all get to continue living like kings is 'cause we got our fingers on the scales in their favor" (Chandor, 2011). This reviling diatribe uncovers the root of what many people consider to be the cause of what later became titled "The Great Recession of 2008": the massive international banks of Wall Street urging mortgage lenders to knowingly lend money to unqualified candidates, all in the search of increasing profit for all financial parties involved. This seemingly morally bereft system of lending to unqualified individuals was furthered by the extreme amounts of cash that these banks were able to cheaply borrow. The idea behind the banks' borrowing money, known as financial leveraging, is to assume debt in exchange for the ability to use the borrowed capital to increase an investment and hopefully maximize its future payout. While this strategy has the potential to augment the investor's returns, it also has the ability to

exacerbate their losses if the investment goes poorly, leaving the borrower legally obligated to repay the creditor both the principal borrowed as well as the interest accumulated during the life of the contract. This toxic combination of extreme leveraging with an industry that appeared void of any sense of morality allowed for the United States' housing market, a $228 Billion industry, to bring the $15 Trillion United States economy to its knees in a matter of months.

This crash of the American economy in 2007 and 2008 brought about financial, personal, and social catastrophes matched by only a few other singular events in this nation's history. Many key financial buzzwords such as "subprime lending," "mortgage-backed securities," "credit default swaps," and "synthetic collateralized debt obligations" sit at the epicenter of what brought about this monumental collapse of the largest economy in world history. However, many people believe that the underlying root of the collapse extends beyond convoluted financial jargon and into a matter of human morality. Blame has been placed on CEOs, mortgage lenders, politicians, and even the average American citizen alike—with calls for legal action against those who the sufferers claim to be responsible. Accusations of intentional morally-deprived financial practices have been made since the collapse, yet only one individual, a 41-year-old executive at Credit Suisse named Kareem Serageldin, has been dealt prison time, having been sentenced to a mere 30 months in federal prison for intentionally hiding millions of dollars of losses by his firm.

The aim of this thesis is to analyze this exact anomaly. With such large a discrepancy existing between the number of people blamed for the crash and the number of people sentenced in a court of law, what role did the morals, or lack thereof, of the accused play in the overall collapse? Was Wall Street truly an ecosystem ripe with fraudulent crooks looking to con unassuming American citizens simply in the name of making a bonus on top of their already

multi-million-dollar salary? Or was the collapse simply a result of a long line of miscalculated bets fueled on by blissful naiveté?

To answer these questions and others requires understanding the underlying toxicity of the financial system that led up to the 2008 collapse, including revisiting the United States' focus on increasing homeownership over the last century, comprehending the complexity of the financial instruments involved, studying how various banks miscalculated the value of their assets and to what extent they did so, unraveling the devolution from honest political policies to deliberately immoral financial practices, and much more.

Chapter 1: The History of U.S. Housing Policy

"The wrong solution to a genuine problem" – William Niskanen (1995)

Introduction

Since the catastrophic years of post-Great Depression America, the focus of much of the United States government's housing policy has been firmly centered on one main idea: increasing homeownership. The idea of an individual's level of success in America has much to do with their ability to fully own his or her own home. To wholly own a home, thereby breaking a reliance on making monthly rental payments, allows the individual to establish a system of investments and savings through the development of home equity. However, with the idea that "the average [historical] home costs between two to three times [what the average family makes annually]" (NPR: A Giant Pool of Money), the capital required to invest in purchasing a home constitutes a significant portion of any individual's net worth. Thus, the United States government's goal has been to find an efficient and sustainable method for providing low- and moderate-income families with affordable home financing options. Government policies aimed at increasing homeownership have generally had one main method of doing so: increasing the liquidity of the mortgage market.

Government-Sponsored Enterprises

The origination of the government-sponsored programs aimed at increasing overall homeownership, particularly for low- and moderate-income communities, began with the creation of the Federal Housing Administration (FHA) and shortly thereafter the Veterans Administration (VA). As part of the National Housing Act of 1934, the FHA offered federal insurance to mortgages lenders on the monthly payments of FHA-approved loans in exchange for a small fee as well as helped to regulate mortgage terms and their related interest rates. Similarly, the VA offered mortgage payment insurance to US veterans. Prior to the FHA's inception, the norm for mortgages was a three-to-five year, floating rate, non-amortizing bond; however, this practice was replaced with the 30-year, fixed rate, fully amortizing bond that generally resembles many of the mortgages issued in the current day.

Soon after the establishment of the FHA, an addition was made to the National Housing Act in the form of the Federal National Mortgage Association (FNMA), colloquially known as "Fannie Mae," in 1938. FNMA's goal was to expand the pool of individuals and families able to afford housing payments by providing mortgage lenders with cheap capital and guarantees on monthly payments for loans that met certain guidelines.

According to Fannie Mae itself, the underlying idea behind its creation was "to provide liquidity and stability to the U.S. housing and mortgage market" (*About Fannie Mae & Freddie Mac | Federal Housing Finance Agency*) in order to expand upon the FHA's original goal of increasing overall homeownership. The plan was to do so by purchasing mortgages that the lenders had distributed by means of assuming debt from large international or institutional investors. Because of its status as a government-sponsored enterprise (GSE), FNMA would raise capital by selling bonds to investors with very low interest rates, which they would then use to

purchase mortgages that adhered to the FHA's underwriting standards (Alford, 2003). By purchasing these mortgages, FNMA provided cheap and efficient capital to mortgage lenders, mortgage brokers, and other primary mortgage market partners, effectively allowing them to reinvest this new capital into providing additional mortgages with lowered interest rates to prospective homeowners who otherwise might have been considered non-creditworthy. All the while, the GSE now assumed the risk of mortgagor default normally taken on by the mortgage originator. Overall, Fannie Mae was successful in materially increasing the liquidity within the housing market while simultaneously establishing what came to be known as the "secondary mortgage market."

Since its inception, Fannie Mae had essentially established a monopoly over this secondary market, and, because of its status as a federally-backed enterprise, there was no single entity or conglomeration of entities that could provide the mortgage originators with capital as cheaply or efficiently as FNMA. This system, however, changed in the year 1968.

Under public pressure during the Vietnam War and as a way to shed the debt accumulated by FNMA off of the government's balance sheet, President Lyndon B. Johnson broke FNMA into the Government National Mortgage Association (GNMA)—commonly known as Ginnie Mae—and a new version of FNMA through the passing of the Housing and Urban Development Act (HUD) of 1968. GNMA acted very similarly to the original FNMA in that it was wholly-owned by the government and purchased only mortgages that were either FHA-, VA-, or HUD-sponsored and guaranteed the payments on these mortgages in exchange for a small fee. At the same time, Fannie became a publicly traded, quasi-shareholder-owned entity that was now able to purchase non-government-backed mortgages that still followed the strict underwriting guidelines of the FHA-, VA-, or HUD-sponsored mortgages under the implicit

backing of the federal government. Ultimately, this partitioning of the original FNMA into GNMA and FNMA further increased the liquidity of the US mortgage market by permitting a government-sponsored entity to transition and expand from public sector and to the private sector.

Moreover, due to the fact that all senior equity of FNMA was owned by the US Treasury, the key aspect defining FNMA was that it was neither fully owned by the government nor fully owned by public shareholders, leaving it in a sort of no-man's land compared to GNMA. While the HUD Act of 1968 allowed FNMA to become a publicly traded company, the firm continued to be federally regulated and reap the benefits of having an implicit financial backing by the federal government, allowing it to borrow money with which to purchase mortgages at heavily discounted rates. Thus, in order to mitigate FNMA's monopoly in the secondary mortgage market, increase competition, and further expand the amount of available capital in the mortgage market, Congress passed the Emergency Home Finance Act of 1970 and established the Federal Home Loan Mortgage Corporation (FHLMC or "Freddie Mac"). Similar in both regulation and function as FNMA, FHLMC was chartered to purchase mortgages that were both government-sponsored and non-government-sponsored, except was made to focus on the "thrift" industry, in comparison to FNMA's focus on the traditional banking sector. Much like a traditional bank, thrifts accept deposits and provide interest payments; however, they are more heavily focused on home loans and other real estate ventures than traditional banks.

Community Reinvestment Act

Despite the effectiveness of Freddie, Fannie, and Ginnie in increasing the liquidity of the overall mortgage market, there were still communities that many people believed to be

underserved, namely low-income and minority neighborhoods. In response to both public and congressional pressure, President Jimmy Carter passed the Community Reinvestment Act (CRA) of 1977, which mandated "the obligation of federally insured depository institutions to help meet the credit needs of communities in which they are chartered, consistent with safe and sound operations" ("The Community Reinvestment Act: Its Evolution and New Challenges," 2007). The passing of the act was intended to combat the belief that many depository institutions would gladly accept deposits from individuals living within that institution's community but were reluctant to provide them with loans. Most notably, the law sought to outlaw "redlining," which is the "unethical practice that puts services (financial and otherwise) out of reach of residents of certain areas based on race, ethnicity, or location of residence" (Redlining | Investopedia), a practice that was common from the 1930s through the 1970s. This convention of not offering services to certain individuals is most widely recognized in the systematic denial of mortgages to prospective homeowners solely based on the default history of the community in which the they live, rather than the individual's own creditworthiness.

Over the subsequent decades since its passing, the CRA underwent a series of amendments that added to its overall reach and impact, including increasing the transparency of each depository institution's loan practices to the public, raising the required minimum amount of loans provided to underserved communities, and restricting certain benefits to banks that failed to meet the CRA's criteria.

Although the bill included the mandate that the banks better serve the communities in which they were based, many critics—bankers and community groups alike—criticized its actual effectiveness, citing that the criteria of assessment was far too subjective and emphasized the process over tangible results. In order to combat these complaints, President Bill Clinton added

an amendment to the bill in 1993 that aimed to clarify "performance standards, [to make] examinations and evaluations more consistent, and [to reduce] the compliance burden" ("The Community Reinvestment Act: Its Evolution and New Challenges," 2007). The administration had now shifted the CRA's review of firms from the original criterion being how many loans they had attempted to provide to being how many the lending agencies actually generated. Accordingly, the total number of mortgages provided to low-income families grew by nearly 80% between 1993 and 2000 (Retsinas and Belsky, 2002).

Many critics of the CRA claim that the government's mandate of requiring the depository institutions to invest their capital into riskier and likely less profitable projects is not only a hindrance to the overall economy but also an unnecessary contraction of the housing market, starkly in contrast to their stated end goal. Others simply cited the inefficiencies caused by forcing depository institutions to divert capital from better performing investments and into worse performing ones, an anti-capitalistic approach to the free market. Of the most important punishments enacted against depository institutions that failed to meet the CRA's criteria was the limited ability for them to merge with or acquire other institutions. Former Chairman of the Federal Reserve, Ben Bernanke, is quoted at the Community Affairs Research Conference in March of 2007 as saying, "State and federal rules prohibited interstate branching or acquisitions in some cases even intrastate branching, reducing competition and the ability of lenders to diversify geographic risk."

Additionally, the pressure applied by the Clinton Administration augmented the total risk that the GSEs, particularly Fannie and Freddie, were forced to assume by requiring them to purchase higher and higher percentages of securities that were made up of "subprime" and non-conforming loans throughout the late 1990s and into President George W. Bush's term during

the early 2000s. Eventually, the accumulation of the overall debt taken on by Fannie and Freddie to meet the federally required standards intended to support housing for low- and moderate-income communities nearly destroyed the two Goliaths of the secondary mortgage market in 2007 and 2008.

Conclusion

Many of the decisions made by the United States federal government throughout the course of the 20th century continually focused on the goal of increasing overall levels of homeownership in America. By establishing the GSEs of Fannie, Freddie, and Ginnie, the government successfully decreased the cost of home financing through increased liquidity of the primary and secondary mortgage markets, thereby providing previously unqualified borrowers with a higher likelihood of establishing home equity by breaking their reliance upon making monthly rental payments. Although these government policies were based upon sound intentions, they inconspicuously led the US economy along a road that would eventually turn highly dangerous. In describing the policies—particularly the CRA—enacted by the US government towards housing, William Niskanen, formerly a member of Ronald Reagan's Council of Economic Advisors and chairman of the Cato Institute, states that they were "the wrong [solutions] to a genuine problem, for the most part created by other government regulations" (Niskanen, 1995).

Chapter 2: Asset-Backed Securities

"You as an individual can diversity your risk. The system as a whole, though, cannot reduce the risk. And that's where the confusion lies." –Lawrence Lindsey (2011)

Introduction

Prior to the collapse of the American economy during the Great Depression, there existed a secondary mortgage market roughly resembling a very primitive version of today's model. The majority of the mortgages that constituted this rudimentary market of the early 20th century were non-amortizing, floating rate, three-to-five year loans collateralized by farm property (Klaman, 1959). These loans would then be individually sold to investors who would receive the rights to both the monthly principal and interest payments via the bank's receipt of the mortgagor's installments. Similar to the GSEs of today, these mortgage originators, known as mortgage guarantee houses, guaranteed the timely payment of both principal and interest to the investors in the case of default by the borrower for a small fee. Most, if not all, investors in this market expected to hold the loan to maturity as no true secondary market for trading mortgage loans existed at the time (McConnell & Buser, 2011). Although the specific elements of this elementary dynamic of borrower-lender-investor were to be replaced by post-Great Depression government policies, it had laid the foundation for one of the most influential markets in American economic history.

The Mortgage-Backed Security

Created by the pooling and securitization of any contractual obligation to pay a debt, such as credit card or student loans, an asset-backed security (ABS) is an investment instrument sold to investors who receive these regular payments made by the original borrowers of the underlying debt. When the specific assets underlying the security are mortgages, the instrument is now an aptly-named Mortgage-Backed Security (MBS) with the regular payments to the investors being the monthly principal and interest installments paid by the mortgagors. As described by Michael Lewis in his *The New York Times* best-seller novel about the 2007-2008 financial crisis, *The Big Short: Inside the Doomsday Machine*, "A mortgage bond wasn't a single giant loan for an explicit fixed term. A mortgage bond was a claim on the cash flows from a pool of thousands of individual home mortgages" (Lewis, p. 7).

This process of turning individual mortgages into an investable security begins with a prospective homeowner contacting either a mortgage lender directly or by contacting a broker who then connects them to a lender. The lender and borrower come to an agreement about the size, lifespan, and interest rate of the loan, which is primarily based on current interest rates and the borrower's credit history, value of assets, and level of savings. Once the lender has provided thousands of different borrowers with mortgages, the lender then sells the rights to most of these mortgages to a securities firm—to one of the three GSEs or to a private securities firm such as an investment bank—but keeps control of some in order to maintain a continuous flow of cash for themselves. The securities firm that purchased the whole mortgages bundles them together into a security that is then marketed and sold to investors in the form of bonds. As the monthly payments from the mortgagors are received by the originator, they are passed onto the securities firm who in turn pays the investors.

With the capital provided to the lender by the securities firm or GSE purchasing the mortgages, the lender is now able to reinvest this capital into additional loans. The ability for the mortgage lender to have a quickly replenished supply of capital with which to provide additional mortgages is what increases the market's overall liquidity. Additionally, at all points along the pipeline from borrower to lender to issuer to investor, a small percentage is taken by each receiving party, with the lender charging a fee for originally developing the mortgage and collecting the monthly payments; the securities firm earning a fee for issuing the bonds and, in the case of the GSEs, for providing payment insurance; and the investor ultimately receiving the remaining monthly payments. While this process of securitization was instrumental in increasing the liquidity in both the primary and secondary mortgage markets, it also allowed for the GSEs, investment banks, or other securities firms to spread the risk assumed by holding the mortgages onto willing investors while still making a profit for themselves.

The GSE-Sponsored MBS Market

Initially offered in 1970 by GNMA with a face value of only $70 million, the first shares of MBSs were sold to investors who received pro-rated cash flows from the pooling of the monthly interest and principal payments of the FHA-, VA-, and HUD-sponsored loans that flowed through the pipeline from borrower to lender to issuer (GNMA in this case) to investor. This system of investors receiving pro-rated payments based on their ownership of the MBS is known as a simple pass-through security and was replicated by both FHLMC in 1971 and by FNMA in 1981. The creation of the MBS was "a further step along this path [to more liquidity]" (McConnell and Buser, 2011) as the tradeable MBS attracted a wider set of investors to the

mortgage market than just the GSEs, thereby increasing the market's liquidity and further reducing the cost of home financing.

Although GNMA was chartered to only purchase government-sponsored loans, FNMA and FHLMC's statuses as shareholder-owned entities granted them the right to buy and sell both government-backed and non-government-backed loans so long as the loans were "conforming," meaning they met the set of standards established by Fannie, Freddie, or Ginnie in regards to the loan's size and the credit quality of the borrower but happened to not be federally sponsored. These restrictive standards, however, did not prevent FNMA or FHLMC from eventually becoming major players in the massive MBS market.

The Multiclass MBS

Despite the relative simplicity of the early MBS system, complexity quietly and quickly entered the equation in the form of the multiclass MBS, also known as a Collateralized Mortgage Obligation (CMO). First issued in 1983 by FHLMC and by FNMA in 1985, the CMO is similar to an MBS except that it is carved into "tranches," or portions, with each segment receiving a credit rating based on its respective risk profile. Structured in descending order of security from the senior (AAA-rated) tranches, mezzanine (AA-, A-, BBB-, and BB-rated) tranches, and unrated equity tranche, this dividing of the CMO by risk allows investors to better customize particular aspects of their investment by following a "sequential pay" system.

Sequential pay securities, such as the CMO, are organized in way that each tranche has separate payment schedules, differing levels of risk, and varying interest rates. The investors in the AAA-rated senior tranche have the first claim to the cash flows from the monthly interest and principal payments of the outstanding bonds until the bonds in this tranche are retired, while the

lower, subordinate tranches receive only monthly interest payments. Once the senior tranches' principals are retired, the AA-rated portion of the mezzanine tranche undergoes the same process of receiving a percentage of the outstanding loan as principal payments in addition to interest installments, while the subordinate tranches still only receive interest until the entirety of the AA-rated bonds is retired. This system of waterfall payments continues until the bonds in the unrated equity tranche have been paid off.

In addition to the lowest tranche having the last claim to the monthly principal payments, they are also the first tranche to be affected in the case of mortgagor default. If there are enough defaults to the point that the entirety of the lowest tranche does not receive their payments, the next lowest tranche is now affected in the same way as the one below it, with this system working in reverse order of the sequential pay schedule. This system is often compared to a building in the middle of a flood with the investor of the lowest tranche being the owner of a ground floor unit. As the flood begins, the ground floor is the first level to be affected, while the higher floors remain untouched. As the water continues to rise, the second floor is only affected once the entire ground floor has been flooded, while the penthouse units (the most senior tranches) are only affected when every floor below it has already been flooded. In essence, the subordinate tranches act as a cushion for the more senior tranches against potential defaults.

Given that the lowest tranches have much later bond maturity dates and are exposed to the most risk of mortgagors defaulting, these tranches are given significantly higher interest rates. On the other hand, the higher rungs of the CMO ladder receive lower interest rates in exchange for earlier payment schedules and better protection against defaults. This exposure of the most subordinate tranches to a potential cessation in payments is known as "Credit (or Default) Risk." Although this risk was recognized in the early MBS market, it was rarely

considered when making investment decisions because these monthly mortgage payments were fully guaranteed by the GSE involved.

Types of Mortgage-Backed Security Risk

Due to the length of a 30-year mortgage, investors in every tranche of the MBS are susceptible to the risk that any long-term bond faces; however, the dynamic developed by the sequential pay CMO allows investors to choose which of the two types of risk inherent to MBS they prefer to assume: Credit Risk or Interest Rate Risk, the latter of which can be further subdivided into two additional types.

As with all bonds, a change in interest rates affects the relative value of the bond currently being held, meaning the holder can potentially suffer losses or capture gains in the process depending on the change. Given that most fixed-rate mortgages (particularly those that are sponsored by the FHA, VA, or HUD or are otherwise GSE-conforming) can be paid off at any time without penalty, when interest rates drop, mortgagors have an incentive to pay off their loans early in order refinance into a lower rate loan. When these debtors choose to prepay and refinance their mortgage at a lower rate, the investors receive their money back sooner than anticipated, no longer receive the future monthly interest payments, and are only able to reinvest their capital at the new *lower* rate. This exposure to receiving their investment sooner than anticipated is known as "Prepayment Contraction" risk as the life of the bond is being shortened by the unexpected increase in prepayments. This form of risk is what Michael Lewis labels in his novel as the most "problematic" aspect of attracting investors to the early, GSE-driven MBS market.

On the other hand, these bonds are also subject to the possibility of a rise in interest rates. When the interest rates rise, the value of the bond experiences a relative devaluation, causing a loss for the investor as they are not able to reinvest the money tied up in the bond at the new *higher* rate. Furthermore, when interest rates rise, prepayments by the debtors will be lower than anticipated. Because the security issuer generates a model of the bond payments based on the size of the loans, amount of investors, and predictions about mortgagors' prepayments, the model's expectations of cash flows to investors will now change, effectively *extending* the timeline of the security's payments. Now, "the security pays later than expected, and the investor cannot take advantage of the more attractive investment opportunities [of the higher rate] with those funds" (SEC Staff Report on MBS, 2003). This subset of interest rate risk is known as "Prepayment Extension" risk.

These inherent risks involved in investing in MBSs is what pushed the market to develop the tranched, sequential pay bonds. According to McDonnell and Buser in their 2011 report titled "The Origins and Evolution of the Market for Mortgage Backed Securities,"

> *"[The] idea [of tranches] was that some investors were reluctant to become active in the MBS market because their long-term maturities coupled with the mortgagor's prepayment option means that the actual maturity of the security is unknown and can be quite long term, thereby exposing a potential investor to substantial interest rate risk, while at the same time exposing the investor to a great deal of uncertainty as to the actual maturity date of the security. Sequential pay CMOs were thought to be a way of overcoming the disadvantages of simple MBSs in that an investor who preferred a shorter-*

term security could buy an early tranche, whereas one who was willing to bear more risk (possibly in return for a higher yield) would be attracted to the later pay tranches."

Thus, through the new method of investing based on differing risks, payments, and interest rates, investors can now better access securities matching their desired risk, return, and maturity needs, ultimately attracting more investors and further increasing the liquidity of the market.

Although this process of securitization of mortgages was quite young and not widely spread, a 1989 study observed that "between 1977 and 1987, the interval during which FNMA and FHLMC became active in the MBS market, the percentage of conforming loans that were securitized by FNMA and FHLMC increased from less than 5% to more than 50%" (Hendershott & Schilling, 1989). Through this creation and subsequent evolution of the MBS, the combination of the financial strength of the GSEs created what came to be the highly liquid and highly profitable secondary mortgage market.

Private Label MBSs

As the secondary mortgage market came to be essentially monopolized by the GSEs, private companies sought the ability to enter the market by doing what the government standards prevented Fannie, Freddie, and Ginnie from doing: creating MBSs from non-conforming mortgages. In the year 1977, a bond trader for Salomon Brothers named Lewis Ranieri followed in the footsteps of the GSEs by developing what came to be known as "non-agency" or "Private Label" Mortgage-Backed Securities (PLS). Unlike the early MBSs whose payments were backed by one of the three government agencies (Fannie, Freddie, or Ginnie) and for which there existed

almost no consideration regarding the effects of a default of the underlying mortgages, Ranieri's MBS was composed of mortgages that FNMA, FHLMC, and GNMA were barred from purchasing, either due to the loan's size ("Jumbo" Loans) or its payment plan ("Adjustable-Rate" Mortgages), or because of the borrower's credit history, their unverifiable/inconsistent income ("Alt-A" loans), or the lack of documentation ("no-doc" or "low-doc" loans). Many of these non-conforming mortgages were simple adjustable-rate mortgages (ARMs), option ARMs, hybrid ARMs, or merely "subprime" loans, which were mortgages given to individuals with weak financial histories or who had not yet established strong credit.

Unlike the standards required for the fixed-rate, GSE-qualifying loans, ARMs are mortgages whose interest rates are based upon an index, such as the London Inter-bank Offering Rate (LIBOR) or the federal funds rate, plus a few hundred basis points, and are readjusted regularly. Option ARMs are ARMs that allow the borrower the option to rollover their monthly principal and interest payments so long as they agree to pay the total accumulated amount by the loan's maturation date. A hybrid ARM is a form of ARM in which the borrower pays an initially low "teaser" rate that lasts for the first few years of the loan and is then regularly readjusted according to an index similar to the standard ARM. All of these types of mortgages fall into the overarching categories of "nonprime" and non-conforming loans.

The main risk involved in investing in the early GSE-issued MBSs is not whether the investors would receive their payments, but rather that they would receive them too early in response to refinancing at lower interest rates. In fact, "The big fear of the 1980s mortgage bond investor was that he would be repaid too quickly, not that he would fail to be repaid at all" (Lewis, p. 7). The private-label MBS replaced this issue of prepayment contraction risk with that of default risk. Now, the investors in the lower tranches of the securities composed of non-

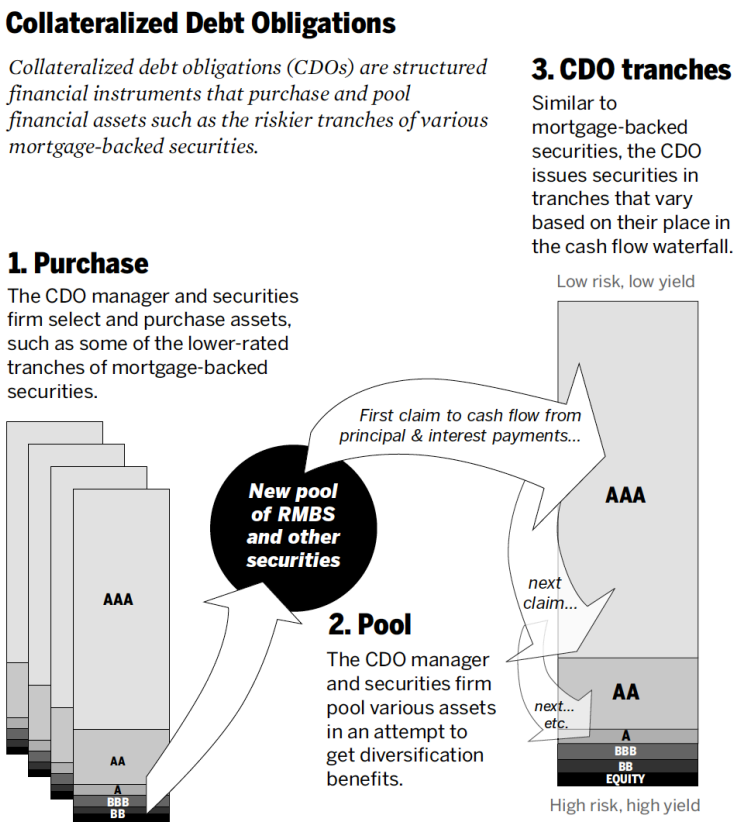
conforming mortgages with non-standardized payment schedules and without financial backing from a GSE were no longer vulnerable to just early or extended repayment but also to simply no repayment at all.

While the non-agency MBS is nearly identical in both structure and function to the agency MBS, the private label version is now subject to different and compounded forms of risk, meaning these investors would require higher payouts in exchange for the increased risk. As such, the securities firms issuing the bonds began engineering new, more complex methods for investing.

Collateralized Debt Obligations and CDOs-Squared

In addition to the securitization of mortgages, the markets of the 1980s began securitizing various types of loans, including "equipment leases, credit card debt, auto loans, and manufactured housing loans" (FCIC Report, 2011). Simultaneously, the amount of outstanding debt in the US credit markets grew nearly three-fold during the 1980s (Kimberly, 2019). With this growth in the outstanding debt market, other investment instruments similar to the ABS grew in popularity, namely the Collateralized Debt Obligation (CDO). First issued in 1987 by an investment bank and structured very similarly to the multiclass MBS, the CDO is divided into tranches with various risk profiles with corresponding payment structures; however, the underlying assets composing the CDO differ from both the agency and non-agency MBSs. Although the non-triple-A-rated tranches of the MBSs generate relatively high returns with relatively stable risk, it was not uncommon for the issuers to struggle to find investors for these tranches. In order to overcome this obstacle, Wall Street turned to its counterparts.

When a securities firm, such as Lehman Brothers, struggles to find investors for various tranches of their MBS—most commonly occurring with the mezzanine tranches—they take these unsold investments and sell them to another investment bank, Morgan Stanley for example, or to a CDO manager (an independent entity or trust formed specifically to underwrite and issue CDOs; it is also called a specialized purpose vehicle or "SPV"). After pooling together thousands of other regularly paying assets such as the ones mentioned above, Morgan Stanley takes the recently purchased shares of the mezzanine tranches from the Lehman Brothers and combines them with the other regularly paying assets, creating a CDO. By combining differing types of assets that appear uncorrelated, the CDO is now considered to be more diversified, thereby lowering the credit risk associated with it. As such, the formerly rated AA, A, BBB, and B segments of the underlying MBS' mezzanine tranche can now be lumped in with the other regularly paying assents and be labeled as AAA-rated investments in the CDO, with the cash flows to investors being dependent upon the cash flow from these mezzanine tranches of the underlying MBS and the additional regularly paying assets (See figure above for a visual explanation). Effectively, the CDO had found a way to



mathematically justify upgrading the risk profile of the MBS' mezzanine tranche without changing its underlying assets, citing the benefits of increased diversification.

This process of selling off the unsold mezzanine tranches of MBSs to CDO managers who would then package them into a new investment security and relabel it as AAA became increasingly popular through the late 1990s and particularly into the early and mid-2000s, and "By 2004, creators of CDOs were the dominant buyers of the BBB-rated tranches of mortgage-backed securities...[and] by 2005, they were buying 'virtually all' of the BBB tranches" (Laurie Goodman et al, 2011). While the popularity of the MBS-backed CDOs grew, the SPVs and investment banks created an even more complicated security: the "CDO squared."

Similar to the process of a CDO issuer purchasing the unsold mezzanine tranches of MBSs, the mezzanine tranches of the CDOs also experienced difficulties in finding willing investors. Once again, Wall Street turned to its counterparts: underwriters for other CDOs began purchasing these unsold mezzanine tranches of CDOs to repackage them into their own CDO, and, by using the same prior logic of diversification, can relabel them as AAA in the new CDO. When the underlying assets of a CDO came to be constituted by around 80% of another CDO, this new CDO is now called a "CDO squared." This ever-growing pipeline from mortgagor to mortgage originator to MBS issuer to CDO manager number 1 to CDO manager number 2 to investor distanced the ultimate cash flow recipient so far from the underlying asset that the ability for any one individual to accurately comprehend what exactly it was they were investing in became increasingly more difficult.

Credit Default Swaps

Following the surging MBS and CDO markets, Wall Street looked for additional, further complex instruments with which to provide to the market for investments. It did so in the form of derivatives based on asset-backed securities, most notably the mortgage-backed CDOs. A derivative is a type of "financial security with a value that is reliant upon, or derived from, an underlying asset or pool of assets" (Derivative | Investopedia) that involves a contract between two or more parties. One form of a derivative, a swap, is an agreement between two parties to "swap" liabilities, cash flows, or interest rate agreements for a given period of time. In the case of the mortgage-backed CDO market, Wall Street created the Credit Default Swap (CDS).

This form of credit derivative involves a party that agrees to take on the risk that the value of the underlying mortgages of the mortgage-backed CDO drops in exchange for receiving monthly payments. These monthly payments come from a second party who now essentially receives insurance on the value of the CDO. The most common way in which the security's value would drop is in the case of a mortgagor's default. When the debtor all the way back and the beginning of the pipeline defaults, the value of the CDO to which the payment is flowing decreases. And, when enough of the debtors of the underlying assets default, the payments to the CDO investors slow, leaving the CDO with a lower value. However, as long as the referenced assets perform, the individual owning the swap will continue to make regular payments for the life of the bond.

The individual who is paying the regular installments in exchange for security against potential defaults is said to have a "short" position on the asset and does so either as a way to hedge against their prior investments or simply as a way to bet against the value of the

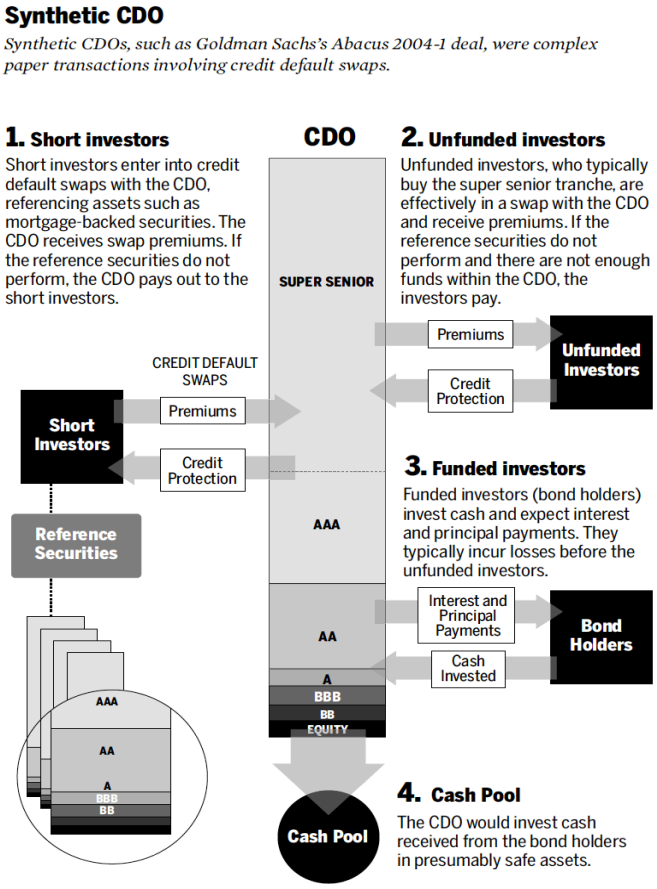
referenced asset. The other individual who has promised to reimburse in the case of defaults is said to be in a "long" position, believing that the asset will retain its value over time.

A key component of the CDS is that neither of the two parties involved in the contract necessarily need to own the rights to the cash flows generated by the CDO, as the agreement between the two parties is solely based on the value of the CDO itself and not on the actual ownership of the referenced assets. Because of this fact, an individual may invest in a CDS solely based on what they believe will happen to the value of the CDO in the future. Furthermore, since there is no true ownership involved, there is no need to generate new assets in order to sell these swaps. In fact, a single asset is able to be referenced by multiple swaps, so long as there is a willing individual on either side of the contract.

Synthetic CDOs

Similar to the process of a CDO re-securitizing a security (the mezzanine tranches of MBSs for example), credit default swaps were able to be pooled together and re-securitized in the form of "synthetic" CDOs. Unlike the traditional cash CDOs, synthetic CDOs do not contain any physical assets but only the contracts that made up the CDSs. The synthetic CDOs are tranched according to varying risk profiles similar to a CDO, but are then further subdivided according to the type of long-positioned investors: "funded" investors and "unfunded" investors. A funded investor is one who actually spends cash to purchase shares in the synthetic CDO.

These investors receive interest and principal payments throughout the life of the contract so long as the securities perform; however, in the case of defaults, the cash used in purchasing shares of the synthetic CDO acts as the first source of repayment to the short investor. Thus, the funded investors are the first to suffer if the value of the asset decreases



Conversely, an unfunded investor is an individual who enters into a swap contract with the CDO, only making profit via the regular payments from the short investors if the CDO performs. If the referenced asset performs poorly enough to the point that the cash spent by the funded investors does not cover the amount owed to the short investor, the unfunded investors are called upon to cover the remaining amount. In this waterfall dynamic of payments in the case of underperformance by the asset, the claim to premium payments made by the short investors go to the unfunded investors while the funded receive only monthly interest and principal payments (See figure above). In essence, investing in a synthetic CDO is less of an investment into a security and more of a bet on the ability of the underlying assets to perform.

As this highly complex instrument made its way into the wide range of securities developed by the investment banks, the final payment recipient became further and further

distanced from the initial cash source. In turn, investors at all points along the way became increasingly reliant upon the ability of credit rating agencies to accurately predict the risk profile of the end investment.

Credit Rating Agencies

When investors are offered the differing tranches into which they are able to invest, the risk profile of each tranche follows the previously mentioned six-level scale from AAA down to the unrated equity tranche. Although the securities firms and GSEs are the parties issuing the investments, they are not the ones developing and labeling the risk profiles; that job is done almost exclusively by two certified rating agencies: Moody's and Standard & Poors.

Throughout the entire process of securitization, benefits are reaped by all parties involved. Borrowers who were previously labeled non-creditworthy are now able to take out loans with generally lower interest rates, lenders garner wages on the fees for originating and managing the loans, securities firms earn fees for issuing the securities, credit rating agencies receive payments for risk evaluation, and investors earn higher interest rates than on similar investments like Treasury notes while believing that they have comparable levels of risk. However, because the investors came to be further and further distanced from the actual assets in which they were investing, the ability for them to accurately value what they were purchasing became quite difficult. Thus, the securities firms and investors alike turned to verified credit rating agencies to determine the risk profile of each security.

The process of rating mortgage-backed securities is highly dependent upon two crucial pieces of criterion. First, the agencies must be able to determine the default probabilities of each individual mortgage within the entire pool of thousands of mortgages; second, they must be able

to determine the level of correlation between each loan across the entirety of the pool that constituted the security. The rule of thumb is higher diversification means higher stability of the security.

The general starting point for establishing an investment's credit rating is based upon related historical data. When looking at the housing market, home price values had historically always trended upwards with some exceptions occurring in the midst of economic downturns. In fact, according to a report by Nobel Laureate, Yale economist, and author of the infamous book *Irrational Exuberance,* Robert J. Shiller, the home value for the average house in America had increased nearly three-times over from the early 1940s to its peak in July of 2006 after adjusting for inflation (Shiller, 2006), suggesting that the seemingly ever increasing value of homes was here to stay. Moreover, delinquency rates on mortgages had remained low with an average of only 1.7% of mortgage loans being "seriously delinquent" (meaning they in the process of foreclosing or are at least 90 days past due date) from 1979 to 2006 (Mayer et al., 2008). Together, this historical data suggested that the default rates of the individual mortgages underlying the MBSs would continue to be low, and, due to the geographical and compositional diversification of the MBSs, CDOs, and CDOs squared, the correlation between the underlying assets was minimal enough that it did not pose a material risk. Thus, the credit rating agencies had justification to continue relabeling the CDOs and CDOs squared composed of AA-, BBB- and BB-rated tranches from prior securities as AAA investments.

Although the rationale behind the process is financially tenable according to their models, the data being used was not characteristic of what the housing market would eventually become. Despite this fact, however, very few people ever seemed to care to realize the minimal extent of

applicability their outdated models truly had in the evolving securitization market of the 21st century.

Conclusion

The landscape of the American financial industry underwent a significant evolution throughout the second half of the 20th and into the early 21st century. With a rise in asset securitization, an ever-developing complexity of investable instruments, and decades of stable economic growth, the evolutions of the industry appeared to be solid on the surface and backed by bona fide financial fluency. However, many of these aforementioned creations, coupled with a political focus on increasing homeownership for less qualified buyers, primed the world's largest ever economy for what would be a collapse of catastrophic proportion.

Chapter 3: The Build Up

"We had convinced ourselves we were in a less risky world." –Lawrence Lindsey (2011)

Introduction

The 1980s and 1990s, decades known as The Great Moderation, were characterized by strong growth in the United States' economy, moderate inflation, general deregulation of the financial industry, low unemployment, and technological revolutions. While some economists feared that by the late 1990s, this combination of economic expansion and declination of unemployment would undoubtedly lead to uncontrolled inflation, Alan Greenspan, then Chairman of the Federal Reserve, resisted urges to raise interest rates as he argued that "increased productivity, including the fruits of the internet revolution, had increased the pace of sustainable growth [for the country]" (Pradnya & Appelbaum, *A History of Fed Leaders and Interest Rates*). As the potentials created by this revolution, namely the commercialization of the internet, excited investors, the perceived values of publicly and privately funded technology companies who had not even begun to generate revenue were skyrocketing. Between the years 1995 to 2000, the Nasdaq composite market index quintupled from a value of 1,052.13 to its March 10th peak of 5048.62 (*NASDAQ Composite – 45 Year Historical Chart*), with stock values of companies like Qualcomm rising nearly 2,718% over a single year. This extraordinary growth, however, only lasted until middle of the year 2000, when the NASDAQ index began a sharp decline of nearly 43% over a four-month span to a year-low of 2332.78 (*NASDAQ Composite – 45 Year Historical Chart*), an event known as the bursting of the Dot Com Bubble.

Even with such a precipitous bursting of the Dot Com Bubble and a resulting stagnation of the US economy, unemployment remained at a 30-year low of around 4%. Attempting to fend

of a recession and to reenergize the economy, the Federal Open Market Committee (FOMC) announced in January of 2001 that it was cutting the federal funds rate by 50 basis points, lowering it from 6% down to 5.5%. Over the course of the next eight months, the FOMC continually lowered the federal funds rate down to 3.5% by September 2001. As the economy remained sluggish, the already low consumer sentiment was only furthered by the September 11, 2001 terrorist attacks against the World Trade Centers in New York, New York and the Pentagon in Washington D.C., forcing Greenspan to act.

As a way to increase consumer confidence, lower the cost of debt, and incentivize spending, the Federal Reserve subsequently continued to lower the federal funds rate to an eventual 45-year low of around 1% by June 2003 (*Federal Reserve Lowers Key Rate to 1%, Lowest Level Since 1958*, 2003), hovering around such levels until the middle of 2004 (*In Policy Shift, Fed Calls a Halt to Raising Rates, 2006*). Although Greenspan's decision to decrease the rates to such a low level successfully helped to revitalize the United States' economy, it also inconspicuously planted the seed for what would allow the housing market to grow into a bubble so large in size that it would eventually cripple the country by 2008: cheap and ample capital.

Shadow Banking

The lending industry in the early part of the 20th century was composed of two main types of depository institutions: banks and thrifts (also called savings and loans associations or "S&L"). The former of the two accepted deposits from customers and in turn loaned out this money to other individuals as well as invested it in securities, while the latter also accepted deposits and generated loans but primarily focusing on mortgages and other real estate investments. This system remained in place until the Great Depression, when, as a protection against bank runs during moments of expected economic downturns, the U.S. government established the Federal Deposit Insurance Corporation (FDIC) as a part of the Glass-Steagall Act of 1933. This government entity provided insurance to a bank customer's deposits in exchange for a small fee paid by the bank. Although the passing of this act helped to protect both traditional banks and S&Ls against bank runs, it also regulated banks' activities by preventing them from taking on excessive risk while establishing a cap on the interest rates that the two institutions are allowed to pay depositors, known as Regulation Q. The Glass-Steagall Act, in combination with the promise of The Federal Reserve, founded in 1913, to act as a lender of last resort to banks short on cash, established the norm for banking and thrift institutions for much of the next 50 years.

During the 1970s, however, financial institutions outside of traditional banks and S&Ls sought to enter the lending market with firms such as Vanguard and Fidelity establishing money market mutual funds (MMMFs). In comparison to deposits in commercial banks or S&Ls, deposits into MMMFs are not insured by the FDIC but are able to receive higher interest rates, driven by the returns on investments made by the funds. In fact, these "deposits" are not truly deposits but purchases of shares of the MMMF that are often redeemable daily. The idea behind

it is that the MMMF invests the shareholders' "deposits" into high-grade, short-term securities such as Treasury bonds (T-bonds) or short-term corporate debt of highly rated companies. Because the companies managing MMMFs are neither banks nor thrifts, they are not subject to the same levels of regulation as these institutions, meaning they can offer higher return rates to the shareholders in exchange for the risk of not having the backing the FDIC's deposit insurance. In exchange for the lack of FDIC-sponsored insurance, the fund implicitly promises to retain the full $1 net asset value (NAV) of the shareholder's purchase. If the NAV of a share drops below $1, this is called "breaking the buck" and generally causes a run on the fund by investors.

Despite MMMFs' lack of an explicit guarantee of the FDIC, many depositors believe these funds to be almost as equivalently as safe as deposits into an FDIC-insured account. In turn, business began exploding in the late 1970s, with the assets deposited into MMMFs increasing from $3 Billion in 1977 to more than $740 Billion in 1995 and $1.64 Trillion by the end of 1999 (Wilmarth, 2002). The skyrocketing amounts of money being invested into these MMMFs allowed the fund managers to invest in additional forms of high-grade, short-term loans, fueling a massive expansion of supply in the short-term lending market. Once again, Wall Street found the perfect candidates in their financial counterparts: the commercial paper and "repo" markets.

Like long-term corporate debt, commercial paper is unsecured (not backed by a physical asset but rather a company's promise to repay the loan) yet has a lifespan of only 270 days or less. The reduced lifespan of commercial paper in comparison to other forms of corporate debt allows for the borrowed capital to have reduced interest rates. Additionally, if the lender agrees, the borrower is often able to continually "roll over" the loan when it has reached its original repayment date with the borrower agreeing to pay additional interest in the end. Because the

loans are backed solely by the borrower's word that they will be able to repay, only large, highly-rated, financially-stable firms are able to easily access this market. Although the commercial paper market had existed for decades, the practice grew significantly starting in the 1970s.

The other lending market that grew in popularity during the 1970s was the repurchase agreements market, or "repo" market. Like the commercial paper market, the repo market was fueled by companies' needs for short-term capital with low interest rates. However, in exchange for providing a borrower with a short-term loan, the lender is given an asset to hold as collateral in the case that the borrower is unable to pay. When the loan's maturity date arrives, the borrower returns the capital with interest and receives back the assets that acted as collateral from the lender. While this process mirrors that of most short-term lending, a repo agreement actually involves a buyer and a seller instead of a borrower and lender. The "borrower" of the capital sells the assets to the "lender" with an agreement to repurchase the assets at a future date, sometimes within a day, with interest. Like the commercial paper market, repo agreements may be rolled over frequently.

Acting as an intermediary between the MMMFs—many of whom were already sponsored by investment banks—and the institutions borrowing the capital, large Wall Street investment banks became the clearing institutions for these short-term financing markets. These parallel, three-pronged markets for lending outside of the traditional banking system constituted part of what came to be coined as "shadow banking," a catch-all phrase for many financial activities that occur between non-bank financial entities beyond the jurisdiction of federal regulators. Overall, the growth of these two markets provided the large financial institutions a source of cheap and easily accessible liquidity.

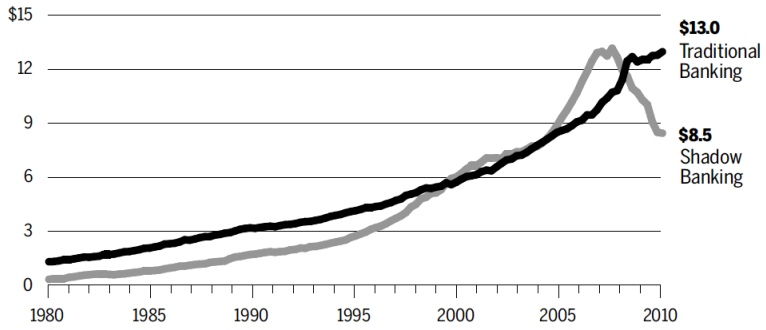
Consolidation of the Banking Industry

As the shadow banking industry continued to grow throughout the 1970s, 1980s, and well through the 1990s, it eventually surpassed the traditional banking industry in terms of the total dollar value of funding available in early 2000 (See figure below). With the rampant growth of the less-regulated shadow banking industry beginning to eclipse that of the traditional market, commercial banks looked to the government for support. The argument stemmed from the belief that the regulations imposed on them by the Glass-Steagall Act of 1933 and their federal supervisors' monitoring of their leverage ratio severely limited their ability to participate in the highly active and profitable securities markets in comparison to Wall Street investment banks and their money market funds that had very limited, if any, leverage standards.

Traditional and Shadow Banking Systems

The funding available through the shadow banking system grew sharply in the 2000s, exceeding the traditional banking system in the years before the crisis.

IN TRILLIONS OF DOLLARS



NOTE: Shadow banking funding includes commercial paper and other short-term borrowing (bankers acceptances), repo, net securities loaned, liabilities of asset-backed securities issuers, and money market mutual fund assets.

SOURCE: Federal Reserve Flow of Funds Report

In response, the Federal Reserve and Congress conceded to many of the commercial banks' complaints through a series of reforms, repeals, and modifications throughout the 1980s and 1990s. These decisions included: removing the cap on interest rates offered to depositors by banks and thrifts, allowing banks to begin underwriting and trading derivatives on certain assets, and permitting banks to provide higher-risk loans with higher interest payments and issue other non-traditional loans such as interest-only, balloon-payment, and various types of ARMs to customers. Arguably the most important change to the regulations on commercial banks and

thrifts was the Congressional passing of the Gramm-Leach-Bliley Act (GLBA) in 1999 which removed the majority of the remaining limitations imposed by the Glass-Steagall Act:

> *"Now, as long as bank holding companies satisfied certain safety and soundness conditions, they could underwrite and sell banking, securities, and insurance products and services. Their securities affiliates were no longer bound by the Fed's 25% limit—their primary regulator, the SEC, set their only boundaries" (FCIC Report, 2011).*

One aspect of GLBA's passing that would prove rather important was the fact that securities firms were still allowed the ability to own thrifts and other loan-generating companies, an ability that grants them access to many FDIC-backed deposits outside of the Fed's supervision. Effectively, the firewall dividing banks and securities firms had been dissolved, allowing the more deposit-focused financial holding companies (Bank of America, JP Morgan, and Citigroup for example) to compete with the powerful non-deposit focused Wall Street investment banks such as Morgan Stanley, Goldman Sachs, and Lehman Brothers.

In the 15 years between 1990 and 2005, 74 "megamergers" occurred in the banking industry, as the 10 largest commercial banks by assets went from owning 25% of the industry's total assets to over 55%, with the five largest U.S. banks—Bank of America, Citigroup, JP Morgan, Wachovia, and Wells Fargo—more than tripling their total assets between 1998 to 2007, from $2.2 trillion up to $6.8 trillion (Jones & Oshinsky, 2009). Mirroring this massive consolidation of the commercial banking industry, the five largest investment banks quadrupled

their assets from $1 trillion to $4 trillion between 1998 and 2007 (FCIC Report, 2011). The landscapes of the banking industry had changed dramatically, and, in order to compete in this new environment, you were going to have to spend—and spend big.

Subprime Lending

While some banks and S&Ls are often reluctant to provide mortgages to individuals who are yet to establish strong credit histories or who have shady financial records, there do exist certain firms who specialize in this practice. This type of lending agency is known as a "subprime lender." In order to compensate the higher risk, the lenders require higher interest rates on their loans or generate new forms of non-traditional loans, such as the various types of ARMs mentioned earlier, interest-only loans (IOs), and principal-only loans (POs). Per Sheila Bair, a former assistant secretary for financial institutions at the Treasury from 2001 to 2002, this market of subprime lending came to be predominantly dominated by nonbank entities by the late 1990s and early 2000s (Testimony before the FCIC, 2010).

Despite their original affordability, many of these non-traditional loans became increasingly dangerous for the borrowers. For example, some of these option ARMs were "negatively-amortizing," meaning that the borrower has the option to rollover their monthly payments. However, if they choose to do so, the rolled over interest and principal payments accumulate on top of the outstanding balance on the mortgage, resulting in outstanding principals that may grow to the point of exceeding the market value of the house purchased via the mortgage.

Many of these agreements had limits on the ratio of outstanding loan to asset value, and when these limits were reached, the borrower was often required to pay down a portion of the

principal or face repercussions such as foreclosure. Similarly, because many of these adjustable-rate mortgages were responsive to changes in the federal funds rate, the low rates of 2001 through 2004 were initially affordable for borrowers, but quickly became drastically too expensive when the interest rates inevitably began to rise. In spite of the increased risk associated with the subprime loans, they were highly profitable, with Washington Mutual, the second-largest mortgage originator in 2002, calling it "our most profitable mortgage loan" (Zucker, 2012).

The Rise of Subprime Securitization

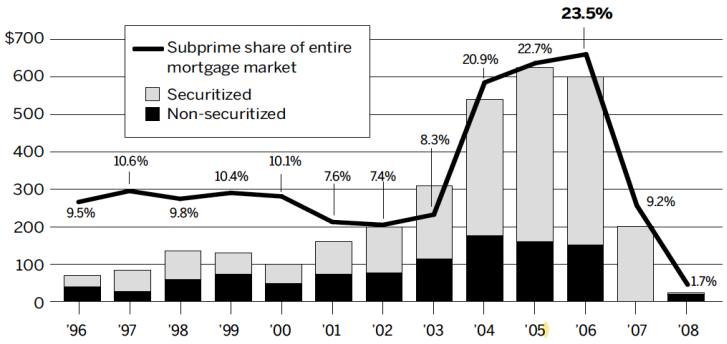
Prior to the revolution of the computer and internet, the process of reviewing an individual's application for a loan was a painstaking procedure, requiring the loan originator to meticulously review the prospective borrower's income, assets, loan history, and many other related factors. During the mid-1990s, however, the practice began to shift its focus towards a more computerized and automatized system, replacing physical review with standardized data, such as FICO scores, to determine an individual's credit worthiness. In a 1996 speech to The National Partners in Homeownership, Fed Chairman Greenspan described the revolution by stating, "Technology has changed the underwriting, originating, and servicing of mortgages and has enabled more efficient pricing of a wider variety of mortgage products tailored for increasingly specialized segments of the market" (Greenspan, Feb. 1996). Greenspan went on to indicate that the referenced "specialized segments of the market" were borrowers of low-down payment mortgages, a form of non-GSE conforming loan.

Concurrently, driven by the enactment of the Community Reinvestment Act (CRA) of 1977 and its subsequent strengthening through the 1980s and 1990s, banks and thrifts alike were being called upon to increase the number and value of loans to less credit worthy individuals or face repercussions, such as rejections of mergers, limitations on new business practices, or the denial of opening additional branches. According to *Inside Mortgage Finance*, a regular publication of mortgage-related newsletters, the total yearly value of subprime mortgages originated grew from roughly $80 billion in 1996 to its peak of over $600 billion in 2005, including a jump from only constituting 7.4% of the entire mortgage market in 2002 to 23.5% in 2006.

Subprime Mortgage Originations

In 2006, $600 billion of subprime loans were originated, most of which were securitized. That year, subprime lending accounted for 23.5% of all mortgage originations.

IN BILLIONS OF DOLLARS



NOTE: Percent securitized is defined as subprime securities issued divided by originations in a given year. In 2007, securities issued exceeded originations.

SOURCE: Inside Mortgage Finance

With the rise in demand for MBSs and CDOs growing throughout the early 2000s, the need for additional mortgages with which to package together as securities continued to grow. In order to meet this demand, investment banks and other securities firms urged lenders to further relax the already loosened lending standards, including requiring less required documentation (a "low-doc" or "no-doc" loan), lower average FICO scores, higher loan-to-value ratios (the ratio of the value of the outstanding loan in comparison to the value of the collateralized property) and more concentration on simply the value of the asset collateralized against the loan: the borrower's home.

Per the FHA's 2010 report titled *Data of the Risk Characteristics and Performance of Single-Family Mortgages Originated from 2001 through 2008 and Financed Secondary Market*, the percentage of total prime borrowers choosing to take out adjustable-rate mortgages vs. fixed-rate mortgages was just 4% in 2001, but by 2004, this number had risen to 21%. In regards to subprime borrowers, a segment of the population that was already heavily involved in the adjustable-rate mortgage department, this number jumped from 60% up to 76% over the same three years (Demyanyk & Van Hemert, 2008).

Furthermore, while big commercial banks and thrifts began to garner the ability to securitize and market MBSs without the help of investment banks, Wall Street began moving into the mortgage origination industry themselves as a way to maintain a steady supply of mortgages with which to build further securities to be sold to the growing number of hungry investors. For example, Lehman Brothers purchased six different mortgage lenders between 1998 and 2004, while Bear Stearns acquired three major subprime originators. At the same time, New Century and Ameriquest, two of the largest and "most aggressive" subprime lenders in the early 2000s, began to concentrate on "originating loans with characteristics for which whole loan buyers will pay a premium" (New Century 10-K, 1999) with these 'whole loan buyers' being the Wall Street investment banks. In 2003, New Century sold $20.8 billion in whole loans, up from $3.1 billion in 2000 (Missal, 2008). Ameriquest jumped from $4 billion up to $39 billion in this same time frame, becoming the largest subprime originator in the country (Mozilo & Mital, 2009).

Ultimately, this quasi mandated number of subprime mortgages and increased efficiency of producing loans compounded upon each other, with the high rate of subprime mortgages beginning to spill over from the primary mortgage market and into the secondary market with

more and more of these riskier subprime loans being securitized into MBSs and CDOs, spreading like a contagion throughout much of the American economy.

Credit Expansion

While the CRA drove the lending agencies to provide more subprime loans, the Fed's decision to lower the federal funds rate in response to the Dot Com Bubble and the September 11, 2001 terrorist attacks only added fuel to the fire of the increasing rate of subprime loan generation. Although the federal funds rate is not directly associated with mortgage interest rates, the two do have a distant relationship: when the federal funds rate is low, the cost to banks borrowing capital is now much cheaper, allowing lending agencies to provide loans with lower interest rates and lower down payments.

Additionally, when the federal funds rate is set low, the value of United States government-sponsored Treasury bonds lowers as well. Now, rather than invest in these low paying investments, investors both abroad and domestic began turning away from the T-bonds' risk-free 1-3% return rates and instead sought out a different investment with higher, and thought to be almost as guaranteed, returns: the housing market. The investors began pouring in, and the results quickly became clear as the MBS market reached its all-time high in 2003, a year in which over $3.5 trillion residential and commercial mortgage-related securities were issued (EXCEL DOC).

In comparison to just three years prior when the rates in the commercial paper market averaged 6.3%, the interest rates of 2003 averaged just 1.1%, while three-month T-bills fell to below 1% (US Department of Treasury, Daily Yield Curve Rates 1990-2006). While the lowering of the federal funds rate had helped to fend off the relatively short recession of 2001,

retaining the federal funds rate at such historical lows meant that mortgage rates, too, remained at historical lows with borrowers, lenders, issuers, and investors all taking advantage. In 2003, the same year as the MBS market reached its peak, more than 1.8 million single-family homes started being constructed, "a rate unseen since the late 1970s" with homeownership rates peaking at 69.4% in 2004 (US Census Bureau, "Housing Vacancies and Homeownership: Quarterly Homeownership Rates for the U.S. and Regions 1965 to Present").

This ballooning of the demand for investments in the housing market fueled on by historically low interest rates and increased volumes of mortgages generated and securitized drove the value of the housing market higher and higher. Between the years 2000 and 2006, the average US home price doubled with the prices in Arizona, California, Florida, and Nevada—collectively known as the sand states—growing by more than two-fold (Choi, et al., 2013). All the while, wages remained stagnant:

> *"Over the [period from 2001 to 2004], median income rose 1.6 percent, while the mean fell 2.3 percent. Over the preceding three-year period, the median had increased 9.5 percent and the mean had increased 17.3 percent" (Bucks, Kennickell, & Moore, 2006).*

As home prices continued to soar and wages remained constant, average home price to annual income ratio jumped from its historical value of two-to-three-times to nearly four-times what the average family made annually. Moreover, "the value of primary residences as a share of nonfinancial assets increased 3.4 percentage points, to 50.3 percent, the largest share ever recorded in the survey [of consumer finances]" (Bucks, Kennickell, and Moore, 2006).

Home Equity

While the ability for an individual to refinance their mortgage in times of lower interest rates generally help them to lower their monthly interest payments at the lower rate, two other forms of refinancing became increasingly popular in the early 2000s: home equity loans and the newly invented home equity line of credit (HELOC). The former of the two is a form of loan taken out by an individual as a lump sum of cash, using their home equity (the difference between the value of their property and the value of their outstanding mortgage balance) to do so. This form of loan is generally large in size and is created by taking out a second mortgage on your home in addition to the one currently outstanding. On the other hand, a home equity line of credit is an offshoot of a home equity loan and functions similarly to a credit card that is based, once again, on the individual's home equity. For a predetermined amount of time, the bank provides the individual with an accessible amount of money and allows them to spend it generally whenever and however they see fit. With a HELOC, the borrower adds on to their original mortgage agreement and only makes payments on the amount of money actually taken out.

Since these two forms of refinancing are dependent upon the individual's home equity, the red-hot housing market of the early 2000s fueled by low interest rates and increased investment in the secondary market sent home equity values continually higher, meaning these individuals were able to refinance via either larger home equity loans or larger HELOCs, thereby withdrawing and having access to greater amounts of money rather than simply refinancing into lower rates to reduce monthly payments. It is estimated that more than one-in-four mortgages were refinanced in 2003 (FCIC Report, 2011), while from 2001 to 2003, an estimated $430

billion was accessed in a form of home equity loans (Greenspan & Kennedy, "Sources and Uses of Equity Extracted from Homes, 2007).

This growth in refinancing and assumption of debt was disproportionally done by individuals with lower incomes. According to the Federal Reserve's 2004 Survey of Consumer Finances,

> *8.6 percent [of families in 2004] (4.8 percent in 2001) had a home equity line of credit with a current balance. Of the types of debt considered, home-secured debt had the largest change in overall prevalence. The use of such debt tends to rise with income. Across wealth groups, it is more nearly equal for groups above the bottom quartile; however, homeowners in the lowest wealth group in 2004 had the highest rate of such borrowing, 81.6 percent...The rising values of primary residences over the 2001−04 period outpaced the increases in home-secured debt and thus raised the typical amount of home equity held by families.*

The survey ultimately concluded, "Over the 2001–2004 period, some families may have felt an important additional incentive from low mortgage interest rates, rapidly appreciating home values, and technological changes that reduced the time and cost of mortgage refinancing," with an estimated 24% of these cash-out refinances being spent on asset such as cars, clothing, jewelry, or other real estate ventures and personal savings rates dropping from 5.2% down to 1.4%.

Although this evolving dynamic of rising home prices, a relaxation of lending practices, an increase in mortgages generated, greater access to various form of home equity, a stagnation of wages, and a decrease in personal savings does not appear sustainable on the surface, Alan Greenspan demonstrated his belief in the system by claiming in a 2002 testimony to the Congressional Joint Economic Committee, "Mortgage markets have been a powerful stabilizing force over the past two years of economic distress by facilitating the extraction of some of the equity that homeowners had built up" ("The Economic Outlook", 2002). He would further double down on this argument two years later in a second testimony to the House Committee on Financial Services ("Federal Reserve Board's Semiannual Monetary Policy Report to the Congress", 2004).

Government-Sponsored Enterprises

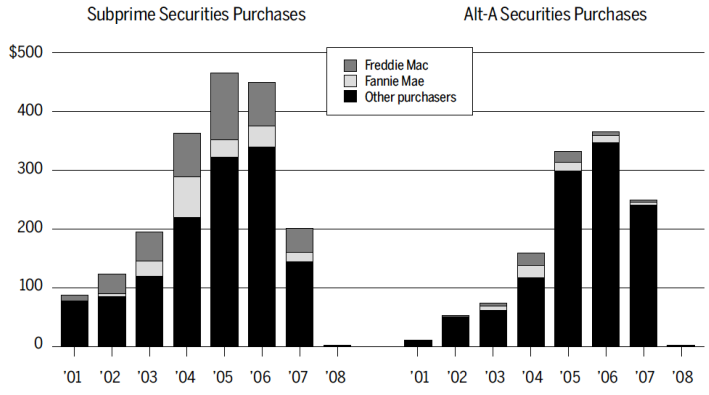
While business on Wall Street was booming due to loosened lending standards and historically cheap credit, the shareholders of both FNMA and FHLMC feared a crumbling of their market share of the total MBS market. These fears combined with an increased rate of refinancing by prime mortgagors and reports of two prodigious accounting scandals that rocked both GSEs in 2003 and 2004 left the two firms in desperate need of increased financial performance. By 2005, thrifts, investment banks, and commercial banks had taken over as the dominant players in the market for home loan securitization.

According to Thomas Lund, the former head of FNMA's single-family lending practice, "We faced two stark choices: stay the courses [or] meet the market where the market is" (Single Family Guarantee Business: Facing Strategic Crossroads, 2005). In order to better compete with the private label mortgage-backed securities, both Fannie and Freddie began loosening their own standards for purchasing securities. Moreover, following various amendments to their charters during the 1990s, both Freddie and Fannie were mandated to further "facilitate the financing of affordable housing for low-income and moderate-income families" (US Code Title 12). Accordingly, they were required to hit minimums in regards to the percentage of mortgages they purchased that were generated in order to serve minority and low-income communities. By 2005, more than 50% of GSEs' loan purchases were required to meet what the Fed defined as 'affordable housing goals' (FCIC Report, 2011). In order to fulfill this minimum, Freddie and Fannie began purchasing subprime and Alt-A non-agency securities throughout the 2000s, many of which continued to be rated AAA by the rating agencies, using the logic discussed in previous chapters as justification. In 2001, the two GSEs purchased less than $10 billion worth of subprime securities; by 2005, they were purchasing roughly $125 billion worth of subprime securities (FCIC Report, 2011).

Buyers of Non-GSE Mortgage-Backed Securities

The GSEs purchased subprime and Alt-A nonagency securities during the 2000s. These purchases peaked in 2004.

IN BILLIONS OF DOLLARS



SOURCES: Inside Mortgage Finance, Fannie Mae, Freddie Mac

Even with this immense growth in the volume of subprime securities purchased by the GSEs, the CFO of FNMA endorsed an approach of further "[increasing] our penetration into the

subprime" (Hilzerath, 2008) at their January 2006 board meeting. Once again, because of their statuses as GSEs with an implicit backing from the federal government, the riskier and riskier investments appeared to be safe in the eyes of the investors.

Conclusion

While the decades leading up to the turn of the millennium were stable economically, the early 2000s were years of rampant growth across various sectors. As the real estate market boomed, interest rates remained low, and the demand for investments in the bourgeoning secondary mortgage market drastically jumped, banks and other lending institutions relaxed their qualification standards, resulting in a rise in subprime lending. Concurrently, the stagnation of wages coupled with low interest rates and increased home equity provided consumers with the ability to borrow cheaply and spend lavishly beyond their traditional means. This combination of increased subprime lending, expanded subprime securitization, a snowballing of overall financial leveraging and a widening gap between consumption and income resulted in record profits for many Wall Street firms. The historical success, however, shrouded what had become a ticking time bomb for the American economy.

Chapter 4: When History's Largest Ever Economy Collapsed

"Like Icarus, they never feared flying ever closer to the sun" – Phil Angelides (2010)

Introduction

Continuing to cite the diversification of the underlying assets in the MBS and CDO market, the belief in 2006 was that these investment instruments would continue to perform, and if they didn't, the value of the collateralized asset—the home—appeared to be of ever increasing value. Thus, in the case of default, the holders of the mortgages would receive the house and investors would still be likely to receive their payments. This theory, though seemingly sound on the surface, was highly dependent upon the value of home prices continuing on a steady rise in value with interest rates remaining low. However, as the consumer price index (CPI), a commonly used measurement for inflation, of mid-2004 began to rise, the Fed sought to mitigate this potential for inflation by beginning what would become a series of interest rate hikes starting in June 2004. These interest rate hikes would have catastrophically rippling effects throughout the entire economy in a matter of months.

Unprecedented Delinquency Rates

The theory was that the securitization market and shadow banking system of the mid 2000s dominated by large investment banks had effectively and efficiently distributed risk among investors; however, when reviewing the extent to which many of these securities had been diversified by investor, the overall diversification was much lower than perceived. As securities firms tended to hold some of the highest rated AAA-senior tranches of their own MBSs as well as other firms' CDOs, a relatively small group of "systemically important" companies came to be exposed to significant credit risk. All the while, the rating agencies continued to use their outdated models of risk evaluation when profiling the various tranches of mortgage-related securities.

With home prices continually rising nationally throughout 2005, they reached their peak in April of 2006. Initially, the pace at which housing prices dropped was sluggish, with Fed Chairman Ben Bernanke even calling the predicted decline in the housing market an orderly readjustment. In contrast, Moody's Investors Service, a branch of the credit rating agency of the same name, predicted that many of the nation's metro areas would undergo a collapse in home prices and that the drops in prices in several areas were expected to continue on into 2008 and 2009 (Zandi, Chen & Carey, 2006). Subsequently, the National Association of Realtors released a report in 2007 stating that the sales of already existing houses had undergone its steepest decline in 25 years, while the St. Louis Federal Reserve of Economic Data (FRED) reported that home prices nationally dropped nearly 22% from their 2006 peak to the 2009 trough (FRED, 2019).

As the Fed began raising interest rates from 1% up to 5.25% over seventeen consecutive times from June of 2004 through September of 2005, the related adjustable-rate mortgages

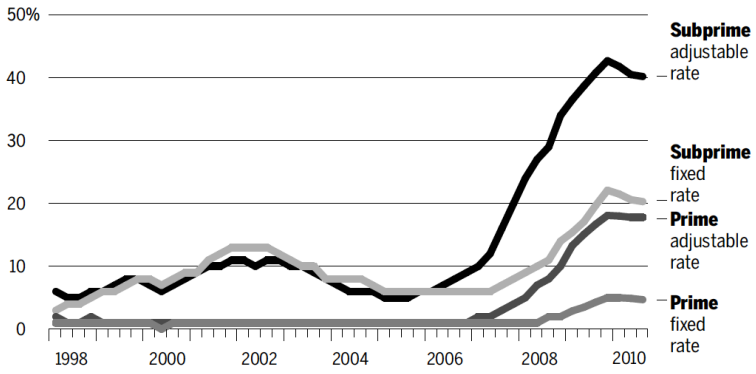
responded in turn: the monthly interest rates on many subprime, Alt-A, and other various adjustable-rate mortgages began to rise, leading to delinquency rates of historic proportions.

Compared to national serious delinquency rates over the prior 25 years that hovered just below 2% (Mayer, Pence, & Sherlund, 2008), the rates started a climb to unprecedented levels in late 2006, hitting 3% by the start of 2007, 5.25% in mid-2008, and eventually surpassing 10% by the end of 2009 with the sand states, which had previously undergone the most intense home price increases, reaching levels nearly double the national average (Mayer, Pence, & Sherlund, 2008). All of a sudden, the steady flow of cash to investors in private label MBSs and CDOs was vanishing with the value of the underlying assets plummeting.

Mortgage Delinquencies by Loan Type

Serious delinquencies started earlier and were substantially higher among subprime adjustable-rate loans, compared with other loan types.

IN PERCENT, BY TYPE



NOTE: Serious delinquencies include mortgages 90 days or more past due and those in foreclosure.
SOURCE: Mortgage Bankers Association National Delinquency Survey

The nation-wide rise in delinquency rates forced the credit rating agencies to review their initial evaluations. Realizing that their assumptions of correlation between delinquency rates across the thousands of mortgages underlying the MBSs were incorrect, they began downgrading many of the previously highly rated tranches down to lower and lower levels. By 2006, Moody's had downgraded 83% of all the 2006 Aaa (Moody's equivalent to Standard & Poors' AAA rating) and all Baa tranches (equivalent to S&P's BBB) (FCIC Report, 2011). Similarly, all of the firms that had warehoused mortgages (meaning held onto as an asset for later purposes) on their balance sheets and that had retained shares of the tranches of their own securities were required to write down the value of

their assets to market value according to "mark-to-market" accounting practices. Soon enough, the complexity of the investment instruments and the instability in the housing market had made it so that just about no one truly knew the material value of assets backed by the housing market.

Credit Crunch

While the low federal funds rate of the early and mid-2000s allowed banks and other firms to borrow short-term money at historic lows, many banks had leveraged their balance sheets to catastrophic proportions, with companies such as Bear Stearns having a 2007 leverage ratio of 38:1 (Sanati, 2010), meaning that they had $38 of assets for every $1 of equity on their balance sheet. Notably, much of this borrowed capital was done via the commercial paper and repo markets with firms posting MBSs and CDOs as collateral. When the delinquency rates on the mortgages underlying these investments rose and the cash flows slowed, neither the lender nor borrower knew what the underlying value of the collateral was. And, if the borrower of the capital became unable to repurchase the assets at the specified future date, the lender took over ownership of the assets. The previously mentioned delinquency rates, however, made it ever more difficult for the MBSs and CDOs to generate consistent cash flows or to retain value in the open market. Thus, both parties involved in the transaction were left with either unpayable debt or illiquid assets. As this unraveling of the repo market continued, lenders came to demand additional assets as collateral and were less willing to accept Alt-A and subprime mortgages.

Furthermore, as the housing market bubble began to collapse and subprime lending quickly slowed, investors in MMMFs began withdrawing their money. These runs on money market funds combined with the decreasing reliability of the financial backing of large, previously solid firms and rising interest rates meant that the short-term lending market began to

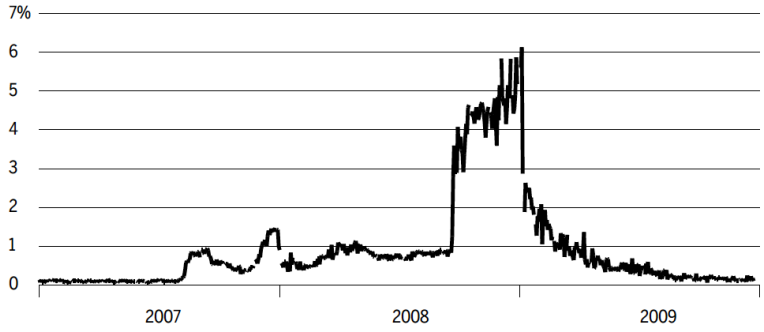
further tighten as firms were unwilling to lend money without reassurance that they would eventually be repaid. If lenders in either the commercial paper or repo markets did decide to provide loans, they insisted upon shorter and shorter maturity dates, further destabilizing the market. Suddenly, the short-term credit lending market had come to a screeching halt.

With the short-term lending market frozen in its tracks, the mortgage lending institutions that had previously relied on banks to purchase their mortgages were now left with an increasing amount of poorly performing subprime loans on their balance sheets. Because these firms were left holding such delinquency-prone loans, some of the largest subprime lending agencies quickly became insolvent. In February of 2007, HSBC, the largest subprime lender in the US at the time, reported that it would be increasing its quarterly provisions for losses by $1.8 billion while New Century released mortgage credit losses far higher than expected. By the end of the following month, New Century, once the second largest subprime lender in the country, had filed for bankruptcy.

Cost of Short-Term Borrowing

During the crisis, the cost of borrowing for lower-rated nonfinancial firms spiked.

IN PERCENT, DAILY



NOTE: Shown is the spread between the rate paid by second-tier rated nonfinancial companies (A2/P2) that borrowed by issuing 30-day commercial paper and the rate paid on similar paper by the best-rated companies.

SOURCE: Federal Reserve Board of Governors

Market Divestiture

Much like the characters in J.C. Chandor's *Margin Call,* the massive Wall Street investment banks quickly realized the true toxicity of their assets and began selling them on the open market for pennies on the dollar. After distribution of an internal report in December of

2006, Goldman Sachs CFO David Viniar and CRO Craig Broderick realized that the firm needed to reduce its exposure to mortgage investments and needed to do so quickly. In turn, the sales team in Goldman's Fixed Income division were directed to sell as many of their ABS and CDO positions as possible, despite the reality that it would be at significant losses. Simultaneously, however, Goldman was continuing to securitize and sell billions of dollars-worth of CDOs and synthetic CDOs to their customers, all the while reducing their own exposure to the market of which the securities they were selling were based by entering into the short position of Credit Default Swaps. This process of selling vast amounts the MBSs and mortgage-backed CDOs for fractions of their original value flooded the market and caused a steep decline in their respective values.

The Collapse of Bear Stearns

Within the powerful investment bank that was Bear Stearns, there was a subsidiary known as Bear Stearns Asset Management (BSAM) that managed two hedge funds focused on structured credit: the High-Grade Structured Credit Fund launched in 2003 and the High-Grade Structured Credit Strategies Enhanced Leverage Fund launched in 2006. Although BSAM was under the supervision of Bear Stearns, it was largely left to do as it pleased.

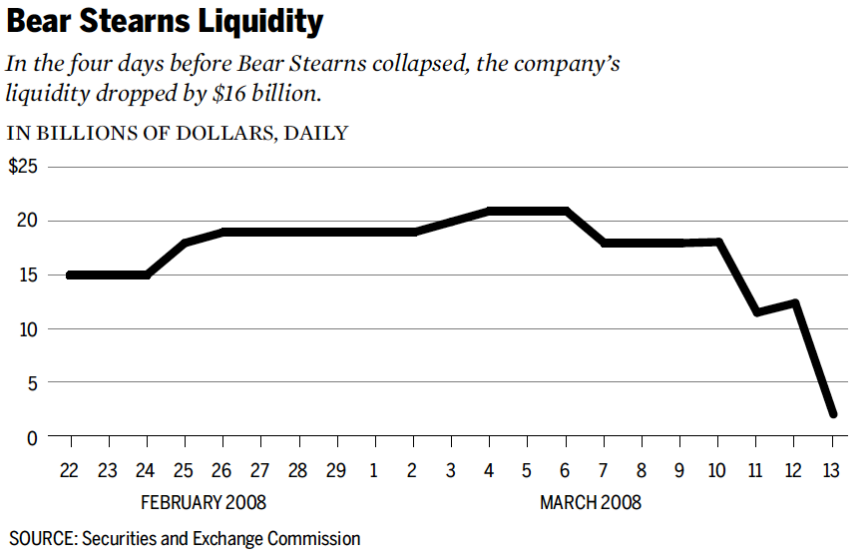
Finding success since its inception, the High-Grade fund established in 2003 had seen double-digit returns in its first three years of existence (FCIC Report, 2011). As is common with hedge funds, much of the leverage used to make investments came from the repo market, a system that allowed the borrowers of the capital to use a minimal percent of their own capital when making investments. While this strategy has the possibility of increasing returns, it also has the possibility of seriously magnifying losses. For example, per Alan Schwartz, the former CEO

of Bear Stearns, lending in the repo markets via mortgage-backed securities allows investors to approach leverage ratios of 20:1, a scenario in which the investor puts forth only 5% of the investment with their own money and using borrowed capital for the remaining 95%. When a firm approaches leverage ratios of 20:1, a 5% increase in the value of the investment will double the investment's value, but a 5% decrease will wipe out all of the initial investment. According to Ralph Cioffi, the manager of the two BSAM funds, "The thesis behind the fund was that the structured credit markets offered yield over and above what their ratings suggested they should offer," and as of April 2007, BSAM reported that 60% of its High-Grade fund's collateral was subprime mortgage-backed CDOs (FCIC Report, 2011).

On April 2nd of 2007, Goldman Sachs, the underwriter of many of the securities into which BSAM had so heavily invested, sent the asset management fund marks on its investments ranging from 65 cents to 100 cents on the dollar, meaning that some of their investments had lost up to 35% of their initial value. On May 1st, Goldman sent BSAM a second round of marks ranging from 55 cents to 100 cents on the dollar, to which BSAM marked down the assets in the Enhanced Leverage Fund by 18%. As the repo lenders for BSAM began to get word of the losses, they started making margin calls, mandating that the funds pay down a portion of their outstanding debts or post additional collateral. As lenders began to make these demands, investors in the funds started to liquidate their investments, yet the parent company still believed that the High-Grade Fund continued to retain value. Bear Stearns chose to sell more than $3 billion worth of high-grade assets and agreed to pay $1.6 billion to remove the fund's repo lenders, while leaving the Enhanced Leverage Fund to survive on its own. By July 31st 2007, the High-Grade fund had dropped by 91% in value; the Enhanced Leverage Fund by 100% ("2 Bear Stearns Funds Are Almost Worthless", 2007). One investor in the High-Grade fund described the

situation by stating, “They didn’t realize this was [Hurricane] Katrina. They thought it was just another storm” (Creswell & Bajaj, 2007).

With the implosion of these two funds, Bear Stearns began to flounder. After assuming the nearly $1.6 billion in subprime assets onto their books from the now collapsing BSAM, Bear Stearns marked down nearly $2 billion of assets in November of 2007. With the microscope of the financial lending industry focused directly upon the firm, lenders to and investors in Bear Stearns quickly began to scrutinize. Despite staying afloat for the remainder of the year in the face of multiple credit downgrades by Moody’s, a series of runs by the bank’s lenders in March of 2008 and JP Morgan’s denial of their March 13th request of a $30 billion line of credit caused the firm’s liquidity to drop by nearly $16 billion within just one week (Securities and Exchange Commission, 2008). Bear Stearns was officially on the brink of bankruptcy by the evening of the 14th.



The Curious Case of Fannie and Freddie

While the mortgage and housing markets began to deteriorate in late 2006 and through 2008, mortgage lenders quickly realized that the loans they had previously generated were not sustainable with the rising interest rates and became willing to refinance the borrowers into more affordable loans. The only problem, however, was what to do with these new loans once they

had been generated: the private-label MBS market was drying up as investors witnessed the declining home prices, the freezing of the short-term lending market, and the total collapse of firms that were previously thought to be financially stable. Looking to the government, the mortgage originators wanted the GSEs, FNMA and FHLMC, to purchase the new loans. Government officials were torn on what to do as they knew the two GSEs, if allowed, had the potential to stabilize the market, yet they would be doing so at the expense of their shareholders.

In the fall of 2007, Fannie and Freddie owned and guaranteed a combined $5.3 trillion on mortgages backed by less than 2% of that in capital (FCIC Report, 2011). Despite the weak financial states of the firms, many public figures pressured the GSEs to continue purchasing these loans when no one else would in order to add stability to a wavering market. By the fourth quarter of 2007, FNMA and FHLMC were purchasing nearly 3 out of every 4 new mortgages sold. Fannie's December 2007 financial statements reported having only $44 billion in capital to support $879 billion in assets and $2.2 trillion in guarantees on MBS payments (FCIC Report, 2011). With these levels of leverage, if losses exceeded only 1.45%, the GSE would become insolvent. Treasury Secretary Hank Paulson knew he would be forced to act soon.

The Collapse of Lehman Brothers

The idea of a firm's solvency is a generally a straightforward concept: when the assets held by the firm are worth more than its liabilities, then the firm is solvent; if that is not the case, then the firm is insolvent. Despite this simplicity, the question of solvency for Lehman Brothers by early 2008 was not so.

Over the course of the late 1990s and early 2000s, Lehman Brothers had grown increasingly involved in the mortgage origination industry after acquiring a major Alt-A lender

named Aurora Loan Services in 1997 and a subprime mortgage lender named BNC Mortgage in 2000. By 2003, Lehman Brothers was the third highest loan provider at $18.2 billion but dwarfed this number with their 2004 value of over $40 billion in loans provided (Williams, *Uncontrolled Risk*). Although the firm posted record profit years in 2005 and 2006, its exposure to the mortgage market was so large that they had "morphed into a real estate hedge fund disguised as an investment bank" (Mark Williams, *Uncontrolled Risk*). Now, following the collapse of Bear Stearns, many regulators began to worry about the fate of the firm in regards to both its solvency and liquidity.

Because of the uncertainty in regards to the future of the real estate market and Lehman's significant exposure to it, concerns about the bank's solvency began to arise. Additionally, its dependency upon short term borrowing made it difficult for investors to remain confident in the face of potential runs. In this scenario, if Lehman's short-term lenders believed that the assets the firm held on its balance sheet were worth less than what was reported, it was likely they would begin to withdraw their funds, require additional assets as collateral, or stop lending to them all together. If this run on the bank by lenders were to happen, the firm's liquidity would drastically shrink, and, due to the falling value of the housing market, the mortgage-backed assets they held would wipe out the solvency of the bank—leaving it with no ability to operate. By the end of August of 2008, Lehman had roughly $600 billion in assets with only $30 billion in equity to back it up ("Lehman Brothers Files For Bankruptcy, Scrambles to Sell Key Business," 2008). A 5% decrease of the value of its assets would result in a complete wipeout of equity and put it on the brink of insolvency.

As Lehman continued to struggle financially throughout the course of much of 2008, the clearing banks between them and the lenders began demanding additional collateral or else

significant credit repercussions. Most notably, JP Morgan demanded that Lehman post $5 billion in new collateral in the form of cash by the start of the business day on Friday September 12th, 2008 or else lose their ability to take out additional credit, a mandate to which Lehman decided to concede. With the firm continuing to struggle to remain solvent, Secretary Treasury Hank Paulson and President of FRBNY Timothy Geithner brought together the CEOs of the largest Wall Street firms at the New York Fed's headquarters in order to devise a plan to save Lehman and prevent a catastrophic collapse of the intricate web of financial lending on Wall Street and beyond. The fear was that if Lehman began to suddenly sell off their toxic assets in an attempt to wind-down their position in the mortgage market, the prices of assets throughout the market would plummet, causing additional margin calls to be made across the Street, thereby further reducing the already tight liquidity of the credit market. The fear was that a collapse of Lehman Brothers posed a systemic risk to the entire economy.

The Collapse of AIG

While the real estate market was booming in the first few years of the century, the market for Credit Default Swaps (CDS) on mortgage-backed CDOs remained small. During the late 1990s, the majority of CDS contracts were written up for corporate debt of large investment-grade firms around the world, such as IBM or GE, with an investment branch of the massive insurance company, American International Group (AIG), acting as the "insurance provider" on the vast majority of the pools of debt. This branch of AIG, known as AIG Financial Partners (AIG FP), was incredibly lucrative in the late 1990s as their aggregate earnings between 1994 and 2004 reached upwards of $5 billion, compared to just $700 million in the six years prior (Greenburg, *The AIG Story*), mainly due to the blossoming "hedging" market. Additionally,

given that the historical default rates of AAA-rated firms in the late 1990s were less than 0.2%, the premiums charged by AIGFP to enter into the CDS contracts were less than 1% of the total value of the referenced assets (Standard & Poor's CreditPro: 1998 edition & Moody's Journal of Fixed Income: "Corporate Bond Defaults and Default Rates 1970-1990).

This early system was highly lucrative through the 1990s and up through 2004; however, "From April 2005 to September 2008...AIG's corporate governance and control, along with AIG FP's fortunes, would change dramatically with disastrous consequences," a time during which AIG FP "accumulated an estimated $80 billion worth of risky financial bets without hedging its exposure" (Greenburg, *The AIG Story*). The most commonly referenced assets in AIG FP's CDSs were now no longer corporate debt but rather common forms of consumer debt such as credit card, student, or auto loans as well as some prime and subprime mortgages. While these cash flow-generating assets were riskier than high-grade corporate debt, they still functioned with relatively low risk and were able to be accurately profiled using the same formula that had assessed corporate risk. The semi-risky assets, though, were replaced almost entirely by subprime mortgage-backed securities: "The 'consumer loan' piles that Wall Street firms...asked AIG to insure went from being 2 percent subprime mortgages to being 95 percent subprime mortgages" (Lewis, p. 70), with no one raising any red flags. Despite this total shift in composition of the assets involved in the CDS, AIG continued to use its traditional model for corporate debt.

Over this time span, AIG had essentially become the largest owner of subprime mortgage bonds in the entire market, all the while continuing to receive premium payments of around only one tenth of one percent due to the bonds' statuses of "super senior AAA-rated" tranches. This $80 billion value of risky financial bets added to what would grow to eventually be over $441

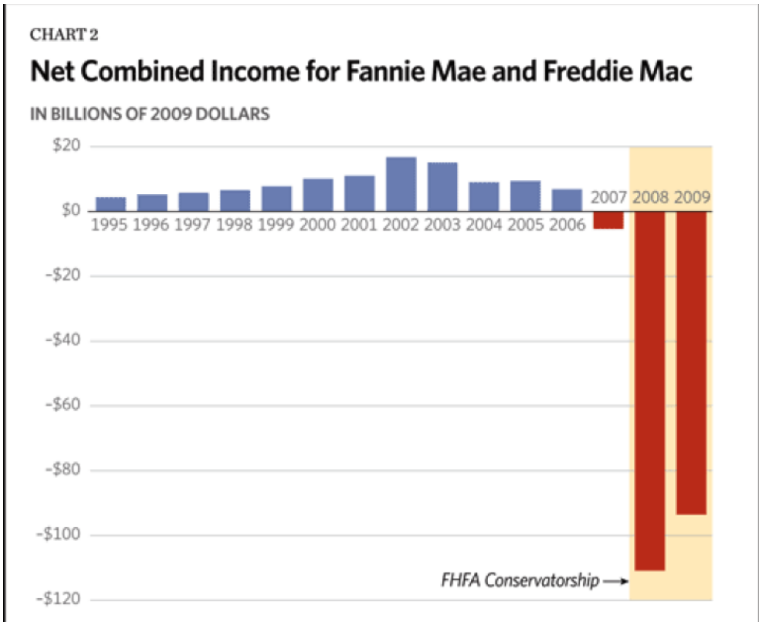
billion by 2008 in the form of credit default swaps (Pittman, 2008), all still done with little to no hedging. Furthermore, due to AIG FP's status as a non-bank entity, they are not bound by the same minimum capital requirements as the banks; as such, AIGFP had entered these contracts with capital constituting only small percentages of the total value in backing. As soon as the credit rating agencies began downgrading their ratings on mortgage-related securities across the board, it was only a matter of time before the margin calls came flooding in.

To Bailout or Not to Bailout

In response to JP Morgan's denial of a line of credit to Bear Sterns on Thursday March 13th, 2008 and in the face of what appeared to be a systemic risk to the economy, the New York Federal Bank Reserve (NYFRB) decided to make a $12.9 billion loan to Bear Stearns via JP Morgan the following day; however, the news of the loan sent Bear's stock plummeting when the markets opened on Friday morning. By the end of the day, Bear had run out of cash, and the NYFRB revoked its loan. Hank Paulson and the rest of the Fed knew that in order to prevent Bear's collapse from spreading to the rest of the market, the government would need to intervene. After agreements from JP Morgan Chase's CEO Jamie Dimon, Bear Stearns' CEO Alan Schwartz, and Bear's board of directors, the NYFRB established Maiden Lane LLC, a firm that would facilitate JP Morgan's acquisition of the collapsing investment bank. After being extended a loan of nearly $29 billion from the New York Federal Reserve and a $1 billion loan from JP Morgan, Maiden Lane purchased $30 billion worth of Bear's assets that JP Morgan believed were too risky to assume in the acquisition. In turn, on Sunday March 16th, 2008, JP Morgan announced its acquisition of Bear Stearns for $2 per share, a decrease of over 98% from their 52-week high (this deal would later be adjusted to a purchase price of $10 per share as a

way to reassure the market against other impending collapses). All while the Fed was deciding how to intervene in Bear Stearns' seemingly inevitable demise, the two giant GSEs, Fannie and Freddie, were facing their own financial dilemmas.

The day-to-day operations of the private securities firms that were purchasing and selling mortgage-related securities in the early and mid-2000s were heavily dependent upon easily accessible and highly liquid capital; the same was true for FNMA and FHLMC. As the MBS market continued to decline well into 2008, Fannie's inability to borrow against its own unreliable securities prevented it from easily raising capital with which to continue its operations. The Treasury then decided on July 13th, 2008 to extend a line of emergency of credit to both Fannie and Freddie, under the agreement that the newly established Federal Housing Finance Agency (FHFA) would have the right to place the two GSEs into receivership should it become necessary. According former Treasury Secretary Larry Summers after reviewing the financial statements of Fannie and Freddie in the Spring of 2008, the two GSEs were "a disaster waiting to happen" (Paulson, p. 87).



By September 7th, both Fannie and Freddie were placed into conservatorship of the FHFA, a move that has been called "one of the most sweeping government interventions in private financial markets in decades" (Shins, 2017). Now, the amount of financial backing able to be extended to the two GSEs was now only limited by the amount of debt that

the entire federal government is able to commit to by law, a lifeline that helped keep the two goliaths and their market afloat. By the end of 2008, Fannie reported expected losses of up to $50 billion with Freddie's being up to $32 billion. The actual loses turned out to be far more significant than expected, the onus of which was placed squarely upon the backs of the American taxpayers to the tune of an eventual $187 billion of financial support over the subsequent years (Amadeo, 2018).

After witnessing the government's intervention in both Bear Stearns' and the GSEs' cases in the months prior to Lehman's impending demise, many people believed that the Fed would once again provide a lifeline to the struggling Lehman by late August. This lifeline would never come. Instead, Paulson, along with the rest of the Fed, proposed that a joint-venture, private-sector solution was the only viable option to prevent Lehman's toxic assets from sinking the market, emphasizing that the government would not extend "any form of extraordinary credit support...not a penny" (Baxter, 2008).

It appeared on Saturday evening as though Lehman had found a solution to its impending collapse: the London-based Barclays investment bank agreed to purchase Lehman Brothers. Just hours later, though, Barclays CEO John Varley relayed to Paulson that the Bank of England and the United Kingdom's Financial Services Authority (FSA) had vetoed the acquisition, citing the possibility that during the acquisition process,

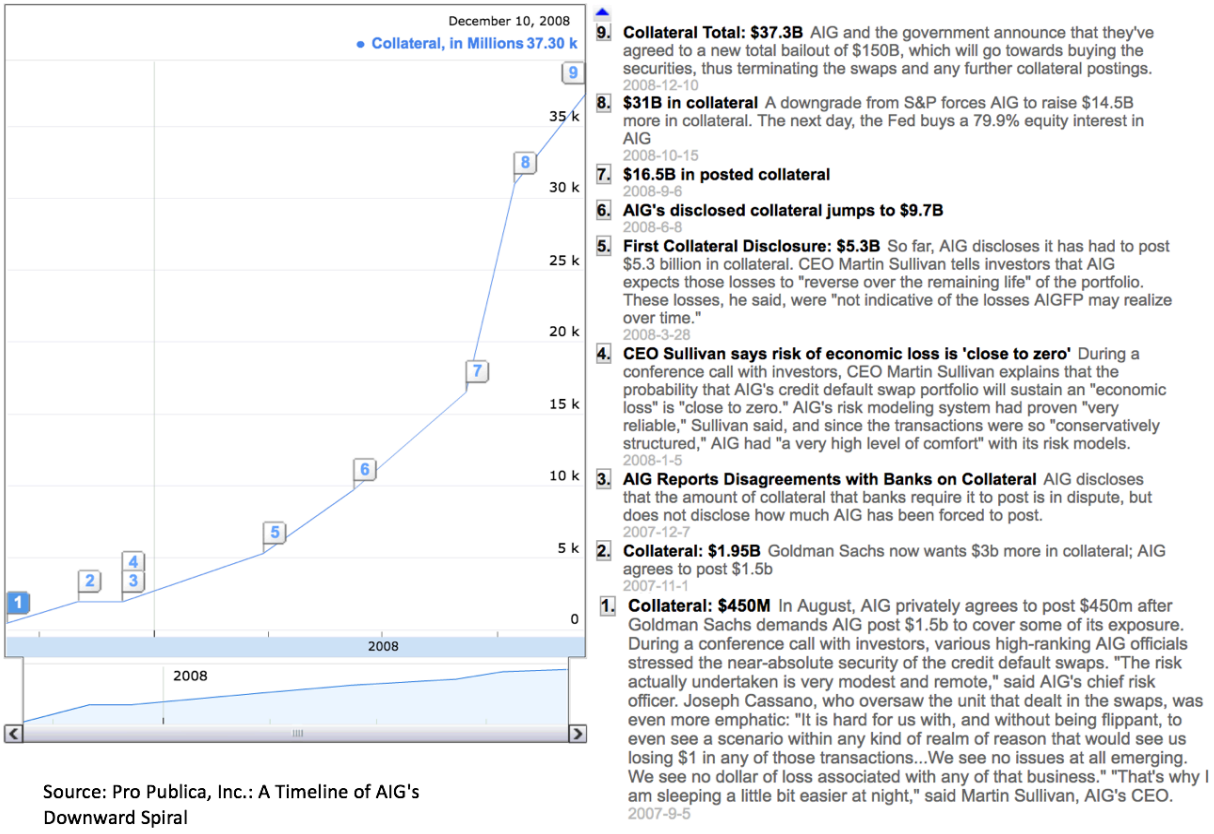
> *"Barclays would have had to provide a (possibly unlimited) guarantee, for an undefined period of time, covering prior and future exposures and liabilities of Lehman that would continue to apply including in respect of all transactions entered into prior to*

the purchase, even in the event the transaction ultimately failed" (FCIC Report 2011").

With Barclays out of the question, the 158-year old institution officially filed for bankruptcy at 1:45AM on Monday morning in what would be the largest bankruptcy in American history, having lost more than 6 and a half times the amount of assets as the second closest bankruptcy in history at the time. Despite the sheer size of Lehman Brothers, the world's largest insurance company, AIG, was teetering on the brink of bankruptcy due to its extreme illiquidity, posing an even more dangerous risk to the American economy that Lehman did.

On the same Friday evening in September when Paulson and Geithner called together the leaders of the largest Wall Street investment banks to deal with Lehman's situation, AIG was forced to pay back $1.4 billion worth of its commercial paper as investors sought to limit their exposure to AIG's position in the faltering housing market. This repayment came on the heels of the insurance giant having already posted a combined $32.1 billion of assets over the previous four months in response to their credit default swap positions. As the mortgage-backed security market continued to spiral downwards, AIG's future was not looking bright: their obligations on credit default swaps were continuing to rise, the value of the mortgage-backed assets they posted as collateral in the repo market were diminishing in value, their credit rating was on the brink of a serious downgrade, their lenders were growing more skittish by the day, and the amount of liquid capital they held in reserve in the case of possible economic downturn was only fractions of what would be required.

The morning of the following Monday (the same day in which Lehman Brothers filed for bankruptcy), the Fed announced its intention to use a syndicate of Wall Street banks led by JP Morgan Chase, Goldman Sachs, and Morgan Stanley to provide a loan to AIG that was substantial enough to inject the necessary amount of liquidity into the firm to keep it afloat for the time being. That same afternoon, S&P, Moody's, and Fitch all released reports downgrading AIG's long-term credit rating, resulting in an additional $20 billion of collateral needed to meet their credit default swap agreements. AIG's stock price dropped over 60% that day, down to $4.76 per share from its Friday close of $12.14 (FCIC Report, 2011).



Source: Pro Publica, Inc.: A Timeline of AIG's Downward Spiral

In response to this decimation of both AIG's market capitalization and credit rating, the Fed's plan of using a syndicate of banks to provide liquidity to the firm failed. Everyone on Wall Street, having witnessed both Bear and Lehman's collapses, was holding tight to their money as

they now watched AIG's already faltering stability continue to deteriorate. The once AAA-rated firm was now unable to access the short-term lending market. What came to be the Fed's response on the following day, Tuesday, September 16th, was a total overhaul of AIG's equity and assets by the government.

Realizing that "an AIG failure would be a disaster for the American people" (Paulson, p. 226), the government, in exchange for 80% of AIG's ownership, would extend to the firm an $85 billion line of credit with an annual interest rate of 14%, over 9-times the current prevailing market interest rate—100% of which would be secured by AIG's assets and would be repaid in no more than two years (Greenburg, *The AIG Story*). Despite this massive governmental revamping, the $85 billion loan would soon prove to not be enough to keep the insurance giant, now a shell of its former self, afloat for long.

Troubled Asset Relief Program

Although the Fed had already established the Primary Dealer Credit Facility (PDCF) and the Term Securities Lending Facility (TSLF) in March of 2008 as two sources of funding meant to increase liquidity within the short-term lending markets, the $300 billion loaned out to both investment and commercial banks in their first six months was not enough to support the ever-destabilizing markets. The Fed was starting to exhaust all of its options.

Less than a week after Lehman's bankruptcy and AIG's structural overhaul, Hank Paulson, in conjunction with Fed Chairman Ben Bernanke and SEC Chairman Chris Cox, announced an initiative that he described as a "comprehensive approach to relieving the stresses on our financial institutions and markets" in which, through funding provided by Congress, the Treasury would have the ability to purchase the "illiquid mortgage assets that are weighing down

our financial institutions and threatening our economy" by "clogging our financial markets" (US Dept. of the Treasury, Press Release 09/19/2008). The proposal, titled the Troubled Asset Relief Program (TARP), was a $700 billion provision given to the Treasury to purchase the toxic, illiquid mortgage-related assets clogging the markets from the financial institutions or to invest in other financial instruments such as stock, thereby injecting necessary liquidity back into the markets. Outside of the utter size of the program, another problem arose: by purchasing stock in these companies, the government would now become a major shareholder in private firms, a form of nationalization of a free market. In order to get around this obstacle, the Treasury announced that it would only purchase preferred, nonvoting stock that had high-paying dividend rates, incentivizing the firms to repay the Treasury sooner rather than later.

Being officially approved by Congress and signed by President George W. Bush on October 3rd, 2008, TARP provided the Treasury with the necessary funds to help re-stabilize the markets. On November 10th, the Treasury and Fed jointly announced that they would be restructuring the line of credit provided to AIG. Now, using the funds provided by TARP, the Treasury purchased $40 billion worth of newly issued preferred AIG stock and reduced the $85 billion credit line down to $60 billion.

On that same day, the Fed implemented a plan similar to what it had done with JP Morgan's acquisition of Bear Stearns back in March: establishing Maiden Lane II and Maiden Lane III, conduits that would help facilitate AIG's repayment of their outstanding debt obligations. Maiden Lane II, funded by a $20 billion loan from the FRBNY, purchased MBS from many of AIG's subsidiaries, allowing them to repay their original lenders. Similarly, Maiden Lane III, funded by a $24 billion FRBNY loan as well as some collateral posted by AIG, would transfer 100% of the debt owed to their financial counterparts at 100 cents on the dollar,

with the French investment bank Société Générale receiving $16.5 billion, Goldman $14 billion, Deutsche Bank $8.5 billion, and Merrill Lynch $6.2 billion, with an additional 12 firms receiving a cumulative $18 billion (Greenburg, *The AIG Story*). Ultimately, over the next few years, the Treasury and the FRBNY would end up provided a total of $182.3 billion worth of loans to AIG.

Payments to AIG Counterparties

Payments to AIG Securities Lending Counterparties

IN BILLIONS OF DOLLARS
Sept. 18 to Dec. 12, 2008

Barclays	$7.0
Deutsche Bank	6.4
BNP Paribas	4.9
Goldman Sachs	4.8
Bank of America	4.5
HSBC	3.3
Citigroup	2.3
Dresdner Kleinwort	2.2
Merrill Lynch	1.9
UBS	1.7
ING	1.5
Morgan Stanley	1.0
Société Générale	0.9
AIG International	0.6
Credit Suisse	0.4
Paloma Securities	0.2
Citadel	0.2
TOTAL	**$43.7**

Payments to AIG Credit Default Swap Counterparties

IN BILLIONS OF DOLLARS
As of Nov. 17, 2008

	Maiden Lane III payment	Collateral payments from AIG
Société Générale	$6.9	$9.6
Goldman Sachs	5.6	8.4
Merrill Lynch	3.1	3.1
Deutsche Bank	2.8	5.7
UBS	2.5	1.3
Calyon	1.2	3.1
Deutsche Zentral-Genossenschaftsbank	1.0	0.8
Bank of Montreal	0.9	0.5
Wachovia	0.8	0.2
Barclays	0.6	0.9
Bank of America	0.5	0.3
Royal Bank of Scotland	0.5	0.6
Dresdner Bank AG	0.4	0.0
Rabobank	0.3	0.3
Landesbank Baden-Wuerttemberg	0.1	0.0
HSBC Bank USA	0.0	0.2
TOTAL	**$27.1**	**$35.0**

SOURCE: Special Inspector General for TARP

Economic Fallout

Despite the total folding of Bearn Stearns, the continual struggles of the two GSEs, and the impeding collapse of Lehman Brothers, the stock market remained relatively stable throughout 2007 and into 2008. This stability, however, collapsed beginning in late August 2008, a timespan at which the Dow Jones Industrial Average began a drop from a level of 11,362 points to 8,461 points by the middle of November, a fall from its October 2007 high of over 14,000 (*DJI Interactive Stock Chart | Dow Jones Industrial Average Stock - Yahoo Finance*). This precipitous drop, along with many others, led to a loss of an estimated 17 trillion dollars of household wealth and a peak of unemployment at over 10%, with the United States losing an estimated 8.3 million jobs during the course of 2008 and 2009 (FCIC, 2011).

While the housing market bubble began to deflate, families who had depended on the steady rise in home equity were now underwater as the outstanding loans they owed to their lenders exceeded the property value of their home. Many of these individuals simply walked away from their homes, opting for foreclosure, a move that would further saturate an already oversaturated housing market, dragging the housing market further downwards. As these same individuals faced the loss of their home and wealth, they reduced their overall consumption, halting nearly all economic growth. Similarly, companies that had depended on quickly and easily accessible credit were forced to cut down on inventories and shrink their staff sizes while simultaneously facing a consumer base reluctant to spend.

Additionally, because of the American economy's vast reach into international markets, the shock was felt around the world. European banks and stock markets faced sharp reductions in their market values while foreign nations saw their currencies experiencing serious devaluations. National governments such as Iceland's were threatened with bankruptcy, while the International Monetary Fund described the situation by stating that the global financial system was on the "brink of a systemic meltdown" (*Financial System on Brink of Meltdown – IMF*).

Conclusion

The economic fallout that occurred after the collapse of Lehman Brothers and the near collapses of Bear Stearns, AIG, and the two GSEs placed the United States economy on the brink of disaster. Precipitous drops in stock prices had not been seen in decades, sending the global economy into a downward spiral with truly no end in sight. Protests by sufferers who claimed that the Wall Street firms reckless spending with no regard for consequences was to blame. Some claimed that predatory practices of the lending agencies were the root cause of collapse. Others

decried the federal government for their decision to use taxpayer money to bailout private companies. Together, many of the complaints centered around one main idea: a lack of morality within the financial industry that eventually sent the US economy into a freefall.

Chapter 5: What Role Did Morals Play?

Financial illiteracy is like being in a rain storm and trying to jump in between the raindrops... eventually it all catches you at the same time

Introduction

In the traditional lending market, one party lends to another party any form of asset with the agreement that it will be returned or repaid at a pre-specified date plus interest. Here, both parties assume risk in the transaction: the borrower takes the risk that he or she will be able to return the borrowed asset plus interest at the agreed upon date, and the lender assumes the risk that the borrower will be able to repay them the full amount plus interest by the future date. This simple model follows the "originate-to-hold" system in which the lender maintains possession of the rights to the loan throughout the life of the contract, thereby holding on to the risk as well.

In comparison, the "originate-to-distribute" model grew out of the blossoming secondary mortgage market. When the mortgage originator sold the rights to the cash flows on the loans to one of the GSEs or to a securities firm, they had effectively removed much of the risk involved for themselves: they continue to earn fees for managing the loan, collecting payments, and enacting punishments for late fees, yet don't hold as much risk in the case that the mortgagor defaults.

When the originator has successfully mitigated their risk, they transition from being risk-averse to being more risk-tolerant. This transformation of the individual's reception towards risk inherently changes the lender's incentives. Now, the incentive is no longer to completely verify that the borrow is truly credit worthy, but rather to increase the pure volume of loans provided, since the originator's revenues in this model are much more dependent upon the total volume flow of payments from borrower rather than the mortgagor's ability to make timely payments.

This same reasoning can also be applied to the banks who securitized the mortgages: they have distributed the rights to the cash flows as well as the risk associated with them to the investors. In turn, they too are now far more risk-tolerant in regards to the actual quality of the underlying assets themselves, all the while earning fees for underwriting the securities and providing a marketplace for the transaction to occur.

While the shift in incentives does not necessarily justify an absolute conclusion that the middle men in this market (the originators and securities firms) were knowingly lending to less creditworthy individuals who would inevitably reach a point of unaffordability during the lifetime of the contract or that they were consciously misleading investors about the true quality of the securities, it does allow for the opening of a conversation about the role of misaligned incentives that became rampant throughout the entire financial industry leading up to the deflation of the housing bubble in 2007.

The Firms: Too Big to Fail

Of the many economic concepts and practices that have come to dominate the markets of the 20th and 21st centuries, the principal of economies of scale is one of the most important. The gist of this concept is that as firms get larger, they are able to spread their fixed costs across increasing amounts of products, lowering the average unit cost with each additional unit. In the end, the firm is now able to produce more of the same good at a lower average cost, allowing the consumer to benefit from this cost reduction. While this theory is most easily seen with firms that make tangible products, it is equally applicable to firms providing services—including both traditional and investment banks.

As these parallel banking industries became increasingly consolidated during the late 1990s and early 2000s, the argument for economies of scale, which financial firms would title "synergies," continued to be at the forefront. Through various mergers and acquisitions both horizontally and vertically, investment banks and lending institutions became much more efficient in their loan processing practice. Direct access by investment banks to FDIC-insured deposit accounts allowed them to generate and securitize higher volumes of mortgages on a more streamlined and overall more efficient process. Although the rate of the loans that were generated after the mergers and acquisitions of the 1990s that were subprime increased, this concurrence of consolidation and popularity of subprime loans did not come as a result of the concentration of the industry, but rather as a result of the demand from all sides of the market: prospective homeowners realized they could now afford a more expensive or additional home with the lower rates; the investors saw how profitable the subprime secondary mortgage market had been in the previous decades; and the banks were willing to act as the intermediary between the two, simultaneously making a profit and working to meet government standards.

Thus, the demand for increasing subprime loans, while augmented by a drifting of the banks along the risk-spectrum from more adverse to more tolerant due to the proliferation of originate-to-distribute model, was generated by factors outside the financial institutions creating the securities, not by the banks themselves.

On the other hand, while the consolidation of the banking industries allowed for the firms to take advantage of economies of scale, it also increased the levels of moral hazard involved. Defined as the ability for one party in a transaction to assume additional risk that negatively affects the other party without necessarily affecting themselves, moral hazard is what allowed banks and hedge funds to extend their risk beyond reasonable levels and put investors, lenders, and other connected banks in positions of extreme risk.

As the firms had grown to be so large through rapid consolidation and so interconnected to each other through the rise in securitization and short-term lending, many of their day-to-day operations became so highly dependent upon the ability of the other large banks, lending agencies, or GSEs to function that if one piece of the system collapsed, the entire industry and beyond would feel the ripples. If this cascading effect is believed to be able to impact a multitude of other firms and individuals well beyond the reach of the originally troubled institution, the government may find itself in a scenario where it must choose whether to support the failing firm, hopefully mitigating the extent of the downfall, or to let the institution crash, taking the risk that the effect of the collapse might bring down the rest of the economy with it. The government found itself in this exact scenario when firm such as Bear Stearns, Lehman Brothers, and AIG teetered on the brink of bankruptcy. This idea that the size and interconnectedness of the banks is too consequential for the government not to react to in times of crisis is known as the "too big to fail" argument.

While in theory it is rational for the government to bail out the firm in the moment of crisis, this implicit backing of the government would lead to other institutions realizing that they, too, are so large and interconnected that the government wouldn't let them fail either. This realization allows the other firms to justify taking on riskier projects with potentially higher payouts, relying on the implicit backing of the federal government to come to their aid in times of crisis. Thus, the argument can be made that despite the risk posed to the entities beyond the directly connected firms, letting the struggling institution fail would send a strong message to firms of similar size and scope that they must follow sound financial practices or risk becoming insolvent with no federal safety net, most likely a positive impact in the long run. This argument, in conjunction with the fact that the Treasury had already expanded is balance sheet to historic level when assisting Bear Stearns and the two GSEs, is what many people believe to be the reason why the government denied Lehman Brothers any federally-sponsored financial assistance in their final days.

In regards to the private sector's role during the economic collapse, the moral hazard fueling the "too big to fail" argument implicitly allowed the massive Wall Street banks to amplify their leverage ratios to levels that exposed not only themselves but every other interconnected bank, client, investor, and lender to extreme amounts of risk—even in the weakest of economic stagnations, all the while knowing that if they were to collapse, the federal government would respond in such a way as to keep them and the rest of the economy afloat.

Two potential conclusions arise from this scenario. First, either the implicit moral hazard from the federal government allowed for the banks and lenders to push morality aside and knowingly take on high risk loans, justifying these decisions with the record profits they were making along the way. Or, conversely, the argument can be made that the firms were

experiencing a form of blissful naiveté about how financially stable they were due to the entire system's reliance on the credit rating agencies' accuracy. Had the CEOs or CFOs of these banks truly realized how exposed they were to slight downturns in the market, no financially literate banker would have continued to operate as they were, regardless what level of moral hazard they had as justification. Thus, it is impossible to conclusively state that a greed-fueled "too big to fail" perspective was what brought the investment banks to spend and lend as they had.

Increased Role of Credit Rating Agencies

Before the ballooning of the securitization markets, credit rating agencies' main source of revenue was in evaluating the risk profile of corporate and municipal bonds. This system changed when the securities market of the 1990s began to blossom. As these newly created securities needed rating in order to be marketed, the firms issuing the investments turned to companies such as Moody's and S&P to do so. Because highly rated securities are able to be sold at higher prices than lower rated ones, security issuers sought to obtain high ratings on their soon-to-be issued bonds from the rating agencies in order to attract more investors.

In turn, an amicable relationship developed between the rating agencies and securities firms issuing the MBSs, CDOs, and CDOs squared as all parties involved continued to generate profits. While the securitization market exploded in the 1990s and 2000s, the rate at which securities firms were bringing in additional securities to be rated mirrored the explosion. When the volumes of securities grew so high, the credit rating agencies became short staffed and grew increasingly reliant upon the financial models of the firms actually issuing the securities to assist in their own ratings. Clearly, this increased reliance on the banks' forecasts poses a conflict of interests, as the securities issuers will want to have their securities rated as highly as possible

while the rating agencies are expected to be fully objective in the evaluations. Additionally, the increased volume of workload poured onto the ratings agencies combined with their outdated models prevented them from being able to accurately profile the risk of the securities.

Another important aspect of consideration in reviewing the credit rating agencies' role in the crisis was their incessant search for increased profits. Given that there are only 2-to-3 rating agency firms within the market and that they all perform almost identically to each other, the rating agencies have an incentive to skew a securities firm's marketed investments towards a higher rating. If the firms continue receiving lower ratings on their securities, meaning lower sales prices to investors, from one agency rather than the other, the firm will logically do more business with the agency that continues to rate their securities higher. Now, in order for the rating agencies to remain competitive within the duopoly market or else suffer losses in market share, revenue and stock price, they might be forced to subjectively rate the securities higher than they actually are. While this practice may provide short-term profits, the long-term consequences can be quite severe, as seen by the bursting of the housing bubble in 2007.

Investment Banks: Lack of Transparency

The original secondary mortgage market made sense. Mortgage-backed securities composed of fixed-rate, long-term, amortizing loans taken out by individuals with legitimate credit histories were a safe investment, and, even if there were defaults, the GSEs were there to fulfill the debtors' payment obligations. Even the first prototypes of the non-GSE-sponsored, private-label MBSs were sound investments as the firms were generally purchasing only prime loans that didn't happen to meet specific GSE qualifications, many of which were primarily based on size and loan-to-value ratios. These mortgages were actually a base for reliable and

consistent cash flows as demonstrated by the success of the secondary mortgage market throughout the 1980s and 1990s. Moreover, the risk that was once concentrated onto individual firms was now spread out to thousands of investors, a widely practiced and sound financial convention.

It wasn't until the devolution of the MBS into other intricately designed securities that the complexity of the instruments increased, the opacity of the compositions became further abstruse, and the man-hours necessary to fully investigate the underlying assets became unfathomable did these investments become too complicated for the market to accurately value.

Each one of the thousands of mortgages that make up these securities is generally written up in a document of more than 100 pages. Thus, to truly know the value of the underlying assets of a single tranche of an MBS requires scouring through thousands of pages of legal jargon on top of already complicated financial valuations. Compare that amount of effort to what would be required in the review of the documentation that underlies a CDO made up of tranches from multiple separate MBSs, which are themselves made up of thousands of individual mortgages from varying sources, plus the myriad of other regularly paying assets in the security. Now, consider how large that number becomes when you go one step further: the CDO squared. In the end, the amount of documentation to sort through just to get to a single underlying loan is essentially insurmountable. At the very end of the line is a security that Michael Lewis describes as "so opaque and complex that it would remain forever misunderstood by investors and rating agencies: the synthetic subprime mortgage bond–backed CDO" (Lewis, p.72). Lewis goes on to pejoratively describe this process of adding complexity to the securities market as such:

> *"Bond technicians could dream up ever more complicated securities without worrying too much about government*

> *regulation—one reason why so many derivatives had been derived, one way or another, from bonds... The opacity and complexity of the bond market was, for big Wall Street firms, a huge advantage. The bond market customer lived in perpetual fear of what he didn't know."*

Despite the author's disparaging remarks regarding Wall Street's development of instruments of ever-increasing complexity, there is nothing inherently immoral nor illegal about this practice. Lewis may claim that the financial engineers of the massive investment banks were purposely convoluting the marketed securities to such a high degree as a way to establish "a huge advantage" over investors, but they were simply doing what banks have done for years: providing a market place for transactions.

In fact, it was common practice for the firm issuing the MBSs and CDOs to maintain ownership of some of the super senior tranches for themselves. So, how could it make sense for them to purchase securities that they knew were unreliable? If the investors wanted to assume the risk that the investment would be profitable, then they should be expected to do the required amount of due diligence and not place their entire reliance upon credit rating agencies who were dealing with brand new securities just like the investors themselves.

Ultimately, the conclusion that banks were openly intending to inaccurately report the quality of the security to the investors cannot be made; they were simply meeting the market wherever it happened to be.

The Consumer and Greed

The connotations around the phrase "investment bank" generally revolve around negative descriptions such as greedy, inconsiderate, or exploitive. Because of these unfavorable images, investment banks receive a lion's share of the blame for the crash, while the average American consumer, who played a much larger role in the collapse of the American economy than is generally acknowledged, does not.

During the early and mid-2000s, the historical lows of the federal funds rate should have allowed for individuals to take advantage of the situation by purchasing the same home that they would have already purchased but at a much cheaper rate. Instead, however, many individuals chose to purchase homes that were well beyond their traditional means, using the initially low teaser rates and low down payments as justification. Once these interest rates began to inevitably tick up, though, the houses they purchased that they could originally afford quickly reached levels that were far beyond the mortgagors' means and defaults began.

Additionally, due to the red-hot housing market, many consumers sought not only more expensive homes but also profit from the real estate and began entering the speculation market: purchasing homes to then later be resold at a higher price. This speculation method, however, was solely dependent upon the housing market continuing on its steady rise. As soon as the prices reached their peaks, the speculators were left holding multiple homes they intended to sell of decreasing value, none of which they could afford the payments for and none of which they could sell. This rise in speculation by average Americans further increased the supply of homes for sale in the already oversaturated market and spurred the market further onto its downward spiral into a state in which consumers were unable to afford their new mortgage payments and were unable to sell the homes.

While it is possible to argue that many of these consumers were simply not financially literate enough to fully understand what it was they were signing on their mortgages, that argument does not relieve them of all blame for the crash. In fact, the greed that propelled them to purchase homes beyond their means as well as the additional homes in the speculation market that allowed for the MBS and CDO machines to continue grinding throughout the 2000s played a significant role in the ballooning of the housing bubble. These mortgagors eventually beginning to default on mortgage payments at rates rarely seen in US history was the beginning of a buildup of a snowball effect that would ripple throughout the much of the US and global economies.

Government: Too Much or Too Little Regulation?

A popular complaint of the 2008 crisis is that the financial system was far too under regulated by the government, allowing Wall Street to borrow and spend money with little supervision. Although it is true that many firms took advantage of the low federal funds rate to leverage their balance sheets to apolitical levels and that deregulation and consolidation of the industry may have played a role in allowing this trend to happen, it is also important to note that governmental regulation actually forced many firms to make riskier loans than they would have traditionally done. Legislation such as the Community Reinvestment Act of 1977 and its subsequent evolutions made it so that banks and other lending agencies were put into a position where they were required to allocate capital to riskier investments instead of safer ones or face repercussions. This trend was a key factor in bringing about the rise of the subprime lending that quickly infected much of the US economy.

Thus, it was this combination of a lack of regulation of some practices of Wall Street and the over-regulation of other practices that created an environment in which the perfect storm for high speculation in a relatively riskier market took off. In fact, because it was this combination of too much and too little regulation that both forced and allowed these firms to fuel the housing market bubble towards its eventual demise that it is difficult to assess the role of the government in the ultimate collapse of the US economy.

Final Conclusion

Attempting to assign blame for the apolitical crash of the 2007-2008 financial crisis is a generally unsatisfactory goal as there was no single player in the long line of mistakes that truly caused the collapse: the consumers' greed led them to spend too much; the lending agencies were spurred on by government mandates and investment bank demands to generate more mortgages; the investment banks borrowed and spent too much on riskier and riskier investments; the credit rating agencies were using outdated algorithms to profile too complex of instruments; investors in mortgage-related securities were blinded by the profits and failed to perform the necessary due diligence to actually know what they were investing in; and the government passed legislation that forced lending agencies into precarious financial situations.

All in all, arguably the most influential aspect of the entire situation was not actually a lack of morals but rather a lack of effort applied by every member of the chain to understand the true toxicity of the underlying assets that the housing bubble was built upon. A character named Jared Vennett in the film *The Big Short*, which is based on Michael Lewis' novel of the same name, describes what separated the individuals who foresaw the collapse from those who didn't in a blunt two-sentence statement: "While the whole world was having a big old party, a few

outsiders and weirdos saw what no one else could...These outsiders saw the giant lie at the heart of the economy, and they saw it by doing something the rest of the suckers never thought to do: *They looked*" (McKay, 2015). This short, two-word conclusion is what truly lies at the heart of the collapse: no one dared to actually know what they were agreeing to because the world somehow appeared to be less risky than ever before. The blissful naiveté of the entire market brought about by seemingly never ending profits fueled this infectious complacency that eventually crippled the United States economy. In short, despite the demands for justice against the heads of Wall Street that sat at the epicenter of the crisis, the crash was not simply a result of a world bereft or morals but rather one of excessive credulity that allowed a $230 billion industry to cripple a $15 trillion economy. Ultimately, trust but verify.

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